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MECCANO MAGAZINE

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VOL. VIII

No. 12

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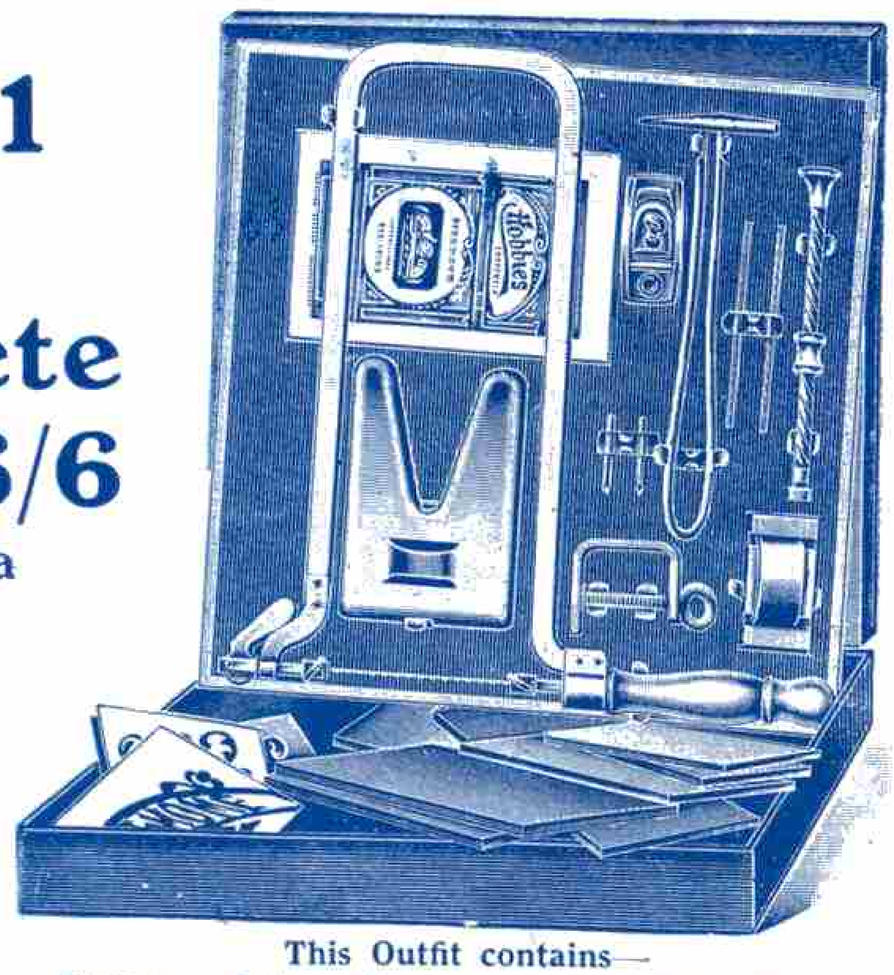

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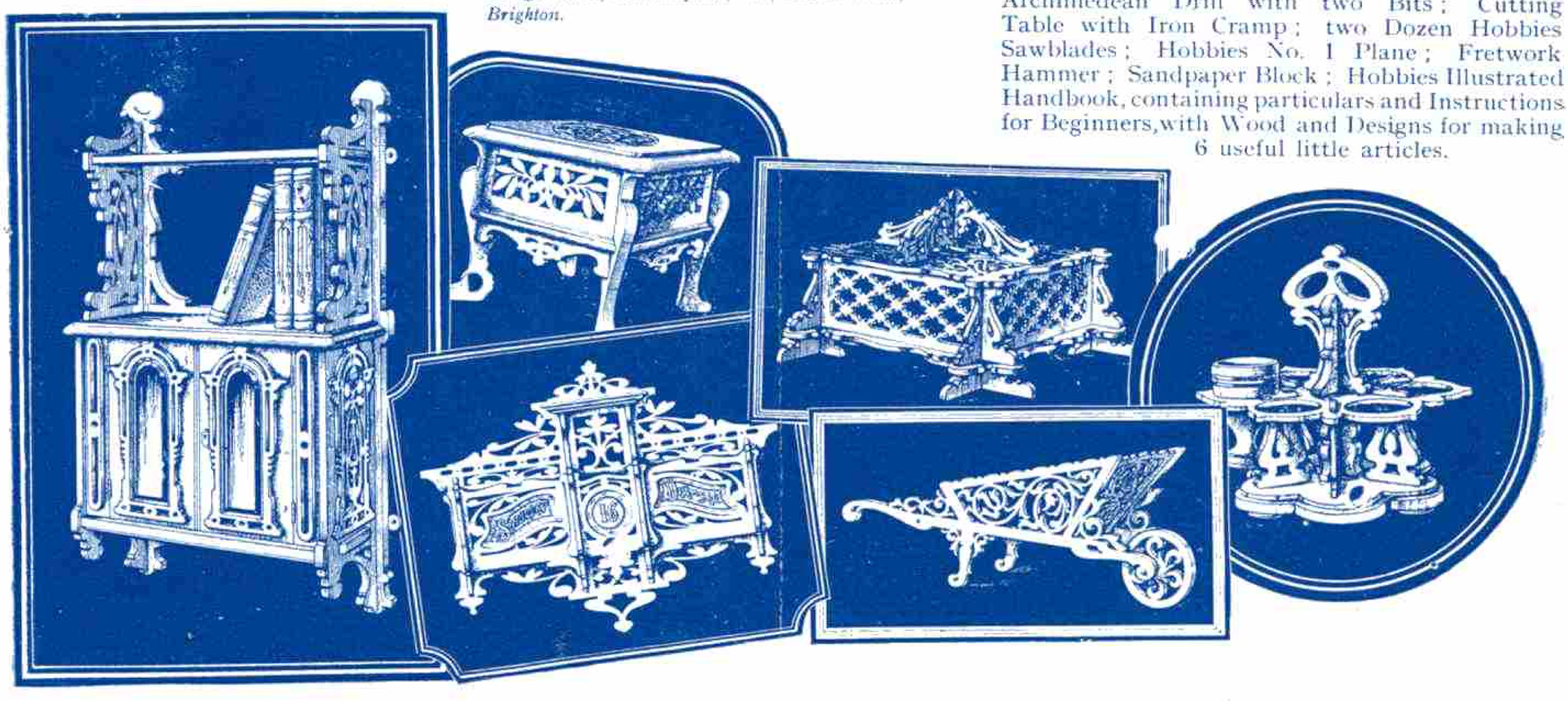


EDITORIAL OFFICE
Binns Road,
LIVERPOOL

MECCANO MAGAZINE

PUBLISHED
IN THE INTERESTS
OF BOYS

Keep the Money in Great Britain

Buy British Goods

IN a grave and earnest speech, one of our Cabinet Ministers recently stated that the only thing that matters in home politics at the present time is unemployment. No one who takes any interest in the conditions in his own town, or in the general conditions throughout the whole country, entertains any doubt whatever that this is a serious and deplorable truth. It is estimated that there are not less than 1,500,000 unemployed in Great Britain. Have you ever seen a crowd of 50,000 persons? Probably some of you have seen something approaching this number of spectators at a big football match. It is an awesome sight. Well! there are thirty crowds of this size walking the streets of the country with nothing to do and earning no money, because no employer is able to find work for them! The causes of this deplorable state of affairs are concerned with rates of exchange, diminution of exports, National Debt and an impoverished Europe.

Neither the causes nor the final remedies can be adequately dealt with in the pages of the "*Meccano Magazine.*" A question which, no doubt, every reader of the "*M.M.*" is asking himself, however, is "What can *I* do to help the situation?" The plain answer to this question is:—"*Buy British-made Goods!*"

No self-respecting person can do otherwise than buy British goods this Christmas. We have no word to say against foreign-made goods, but our nation is sick and we must apply a remedy. If you spend 20/– on a foreign-made present this Christmas, at least 10/– of that sum will go abroad to be paid to foreign workpeople. If you spend the same sum on a British-made toy, the whole of the 20/– remains in this country. That is surely plain enough.

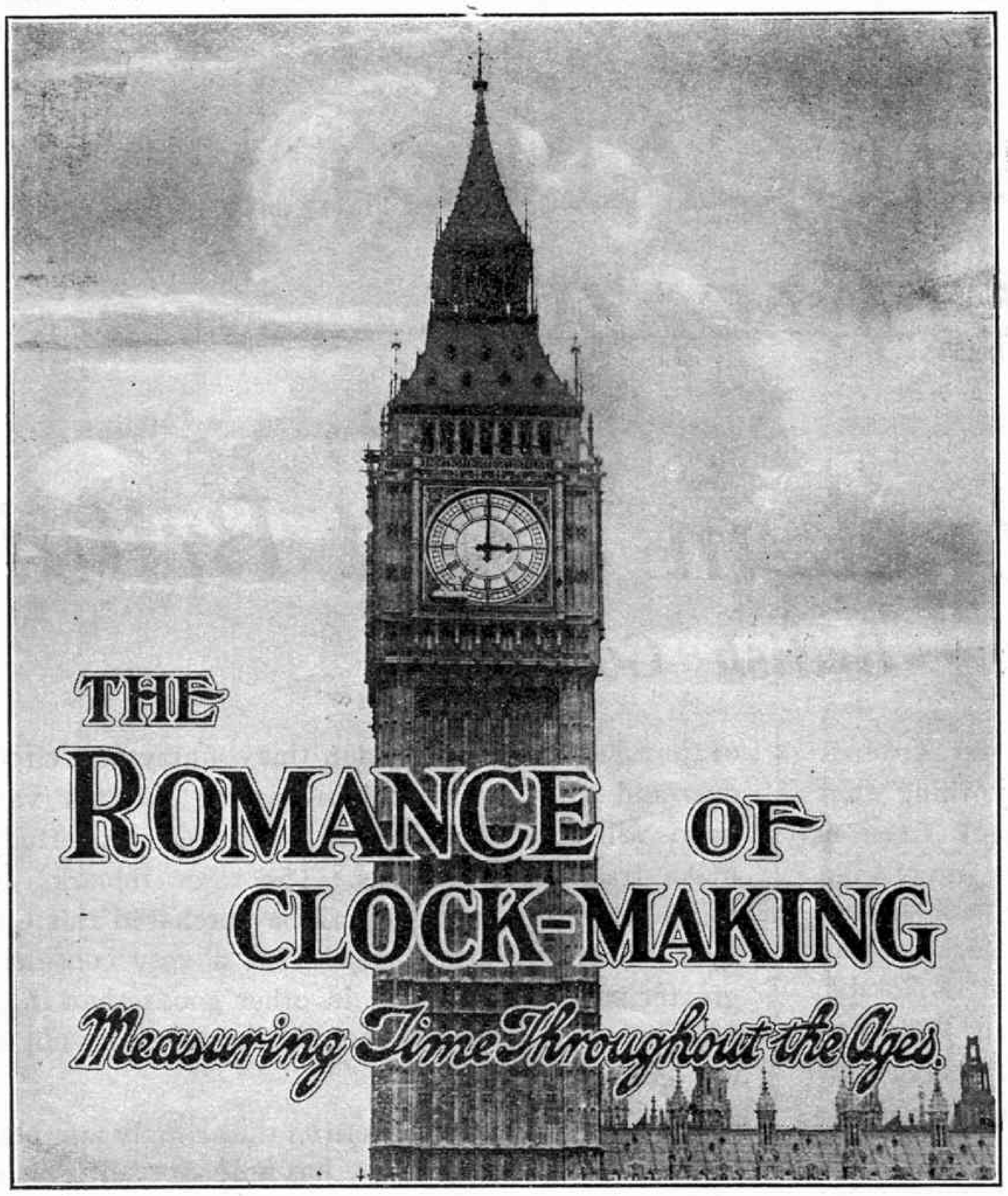
At least £500,000 will be spent on toys this Christmas in Great Britain, and if foreign-made toys are purchased we shall send out of the country £250,000 in good English money to assist other nations to get on their feet. If British-made toys are purchased the whole of the £500,000 will remain in this country, will circulate over and over again, and in passing through various hands will provide employment and help wonderfully to make trade better for us. The same remarks apply to all other presents that will be purchased this Christmas. The only difference is that a very considerably greater sum will be spent in other goods than in toys. It is up to us all to see that this money does not leave our country.

We have set out the situation thus simply and plainly, feeling that the British boy has only to realise the state of affairs to act definitely and as a patriot.

There need be no fear that in buying British-made goods there will be any sacrifice as regards quality, ingenuity or cleverness. Many British toys are better—most of them every whit as good—as the best foreign-made articles. We could name off-hand half-a-dozen British firms who produce toys that are better than anything ever imported from abroad. British toys are well-designed, well-constructed and they are good value.

One of the difficulties confronting purchasers is to know for certain what goods really are British. In this matter we can be of some assistance. Every toy advertised in this issue of the "*M.M.*" is made in this country and may be purchased with complete confidence. Every book and every other present advertised in our columns is the product of British labour. For quality and value they cannot be surpassed by any imported goods.

If you buy any of the splendid presents advertised in the "*M.M.*" you will be doing a wise thing, a patriotic thing, and, incidentally, a service to the "*M.M.*" If you purchase something else, then it is the patriotic thing to ask if it is British made. See that the money that you spend is retained in this country and devoted to softening the hard lot of the million and a half British citizens who are suffering through no fault of their own.



PART II.

OUR readers will remember that in the first instalment of this article, which appeared in our last issue, we dealt with the several ancient methods of measuring time. These included the sun-dial, water-clock and sand-glass. Another method of measuring time, before clocks were invented, was by means of long candles, which were made to burn for a certain number of hours.

These candle clocks were in use at the time of Alfred the Great, and whilst the King was a fugitive in his own country he vowed that if ever he were restored to his kingdom he would devote a third of his time to the service of God. Later, when he achieved his desire, he ordered a number of candles to be made so that he might divide his time in accordance with his vow. The candles burned for exactly four hours and were lighted one after another by one of Alfred's chaplains, who also gave the King due warning of the passing of the hours.

A New Type of Clock

Neither sun-dials, water-clocks, sand-glasses nor candles solved the problem of accurately measuring time. This did not become an accomplished fact until the invention of the weight-driven wheel clock. It is impossible to say exactly when this type of clock commenced to supersede the ancient time measures. Many vague allusions to wheel clocks occur at a very early period, but whether these were some form of water-clock or whether they were actually wheel and weight clocks seems doubtful. To a certain extent, wheel clocks were a development of water-clocks, in the later models of which a paddle-wheel took the place of the empty vessel and its floating figure. The water dropped on to the paddles of the wheel, driving it around; every time the wheel made a complete circuit a gong was struck.

It is believed that the Greeks introduced mechanical movements to take the place of the gong, and also that they connected the wheel with a series of cogs, moving an indicator on a dial. Later a falling weight took the place of the dripping water, and in this way the weight-driven clock came into existence. Some believe that credit for its invention is due to Archimedes, the famous mathematician, who lived in the third century B.C., but whether or not he really did invent the type we do not know.

The First Wheel Clocks

Although there is no record earlier than 1120 A.D. in which a weight-driven clock is definitely described, there seems to be little doubt that weight-clocks were used in the monasteries of Europe in the 11th century. Probably these clocks had no dial or hands, but only struck a bell at certain hours to call the monks to prayer. This was an improvement on the previous methods, however, for until then it was necessary for one of the monks to watch the stars in order to know when it was time to awaken his brethren for early morning prayers.

The wheel-clock was perfected by a German named Henry de Wyck. A rope with a weight attached was wound round a cylinder or barrel, which resembled the roller of a household mangle. As the weight dropped, the barrel revolved, moving the clock hand through a train of gear wheels.

In his early models, de Wyck found that as the weight dropped the speed at which the wheels revolved became faster and faster. When the end of the rope was reached the barrel revolved so rapidly that the hour hand was actually thrown off its spindle! De Wyck persevered in his experiments to overcome the difficulty, however, and did so by fitting a series of spikes to a small wheel, which then resembled a pawl and ratchet and checked the revolutions of the barrel. The King of France, Charles V., heard about de Wyck's wonderful clock, and asked for one to be made for his palace. Thus it was that the first mechanical clock to be made in France was made by a German citizen.

Discovery of the Pendulum

Shortly after De Wyck's success the whole principle of clock-making was revolutionised by the discovery of the pendulum by the famous Italian, Galileo Galilei, then a youth of 18 years of age. One day in the Cathedral at Pisa, he noticed the regular movements of a hanging lamp that had been set moving when being lighted. No doubt many people had seen a lamp swinging to and fro before, but had thought no more about it. Galileo was struck by the fact that the motion of the lamp never seemed to vary, however, and he decided to test its accuracy. Watches were unknown then, so holding his pulse and feeling his own heart-beats, he counted the time required for one swing of the lamp. To his amazement he found that the lamp required always the same amount of time to complete one swing, although the swings were becoming gradually of less extent each moment. Again and again he repeated the experiment, and each time the result was the same.

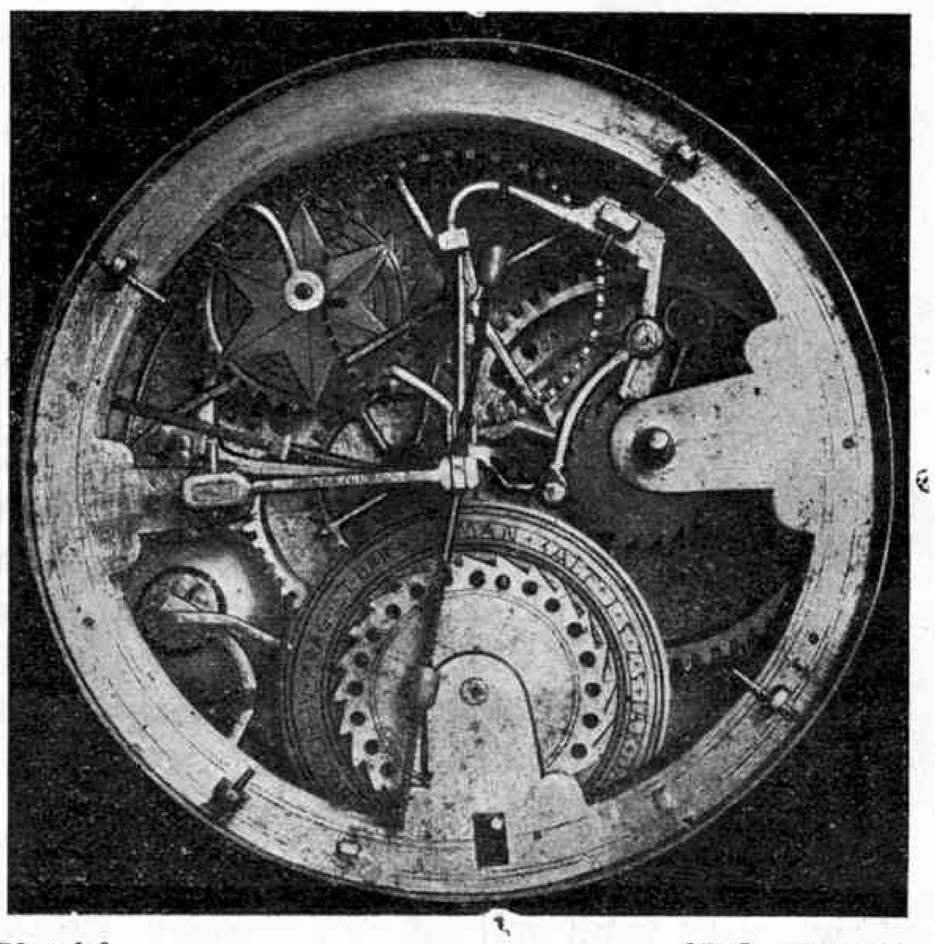


Photo by [*R. S. Antiquities*

The First Portable Clock made by Zech

Convinced of the value of his discovery, Galileo soon completed a model of the lamp by fixing a weight to the end of a long bar of metal, and it was not long before he had adapted this pendulum to work an astronomical clock.

Solving a Mystery

Once the principle had been established, pendulum clocks became common, and at last the world had a fairly accurate means of measuring time. The next step was to improve the clocks so that they were even more accurate.

In this connection there was one particular trouble to be overcome, which was to understand why the clocks always went faster in winter than in summer. In those days very little was known about the various properties and peculiarities of metal, and it was a long time before the mystery was solved. Popular opinion had it that in some unknown manner the sun affected the clocks in the summer. In the main this idea was quite correct, of course, for the difference in the clock's speed was actually due to the expansion or contraction of the metal of which it was constructed. In the hot days of summer the metal expanded, the pendulum-rod became longer, and the pendulum required longer to make its beat. In the winter the reverse was the case, and then the clocks always ran a little fast.

When more knowledge was obtained about metals, and when their different rates of expansion and contraction were discovered, the mystery was solved.

An Ingenious Device

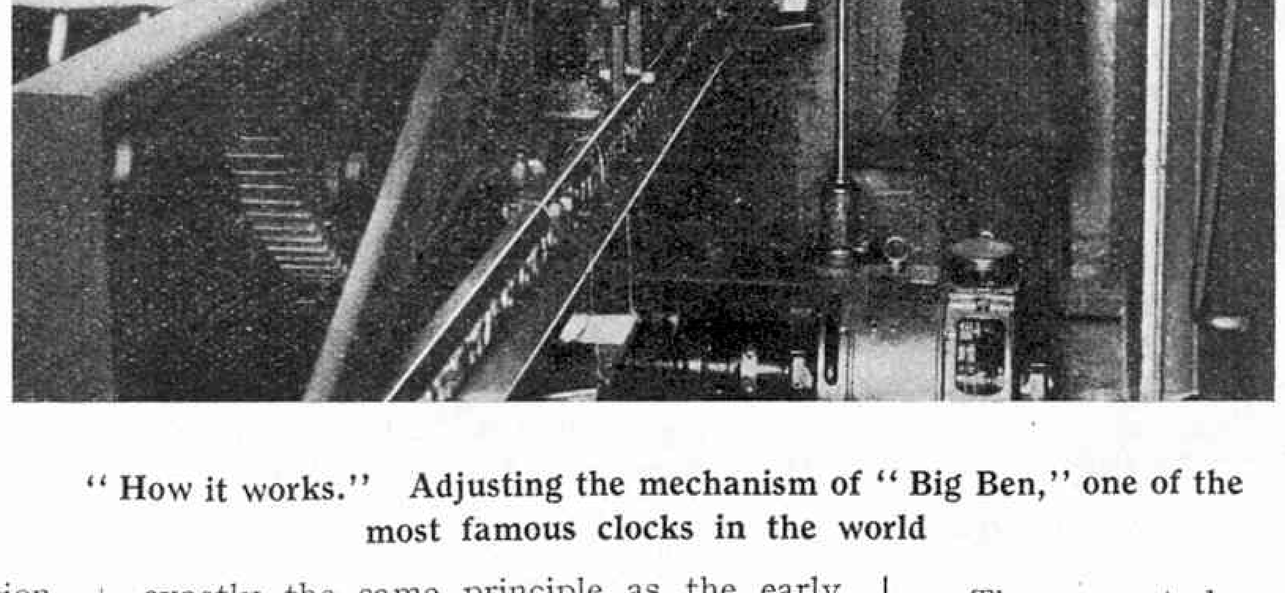
The difficulty was overcome in a very ingenious manner. The heavy metal weight of the pendulum was replaced with a vessel filled with mercury. Although the pendulum-rod continued to expand and lengthen during the summer, the mercury in the jar also expanded, rising higher in its containing vessel. This rising of the mercury had exactly the same effect as raising the weight further up the pendulum rod, a procedure that—as everyone knows—causes the pendulum to beat more quickly. The mercury therefore automatically compensated for the alteration in the length of the pendulum-rod, and the clock was able to keep perfect time without attention at any season of the year.

So accurate is this method of compensation by mercury that it is still used at the present time in astronomical clocks. It may also be sometimes seen in the clocks that register Greenwich time at large watch-makers and jewellers' shops. By the invention of the mercury compensating device, pendulum clocks were more or less perfected, though several minor improvements were afterwards made in the gearing and the method of indicating the hour.

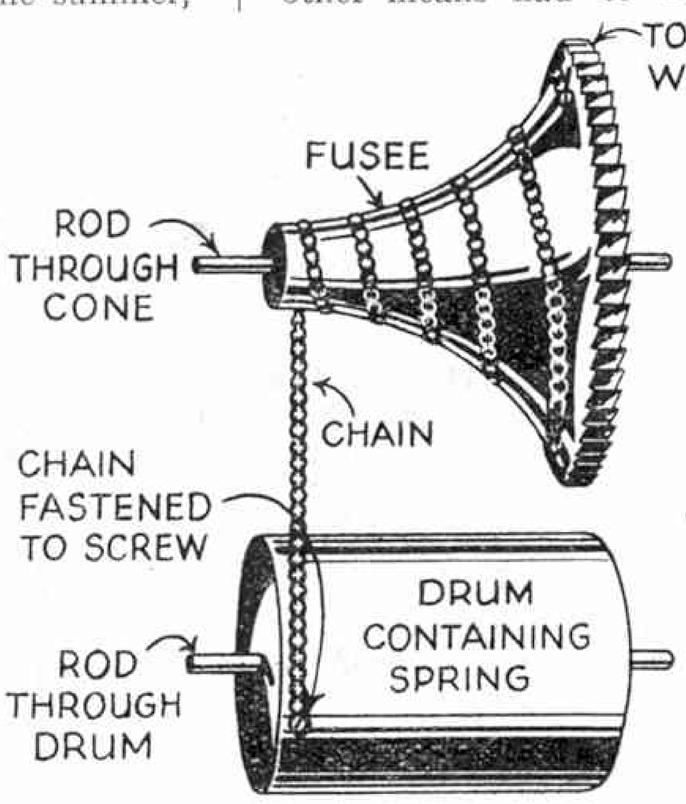
Portable Clocks

The first pendulum clocks were of the "grandfather" type. It is interesting to know that the Meccano Clock and other present-day clocks are constructed on exactly the same principle as the early clocks. After "grandfather" clocks had been in use for some time, clockmakers turned their attention to the construction of smaller clocks. These were called "portable clocks," and it is from them that our watches originated.

As it is obviously impossible to use a pendulum in a small portable clock, some other means had to be used for driving the mechanism.



"How it works." Adjusting the mechanism of "Big Ben," one of the most famous clocks in the world



The Fusee, the wonderful device that overcame a difficulty in clock and watch mechanism

About 1500 Peter Hele of Nuremberg found that a coiled spring might be used instead of a weight, for both store up energy of a similar nature.

Trouble was soon met with, however, for it was found that as the spring unwound itself and lost its tension, the speed of the wheels became slower and slower, and the clock would not keep accurate time. It was apparent that to overcome this difficulty the mechanism must be made easier to drive when the action of the spring became weaker.

A Wonderful Invention

Here was a problem, indeed! Watchmakers were not dismayed, however, and in 1525 Jacob Zech, of Prague, brought forward a solution. In his device the mainspring was contained in a drum, which revolved as the spring uncoiled. To the drum was attached one end of a tiny chain, or a string of cat-gut, which was wound on to a kind of conical roller called the "fusee." When the spring was fully wound, the chain lay at the small end of the fusee, where it had very little leverage on the clock mechanism. As the mainspring unwound, and its force became less, the chain came off a larger radius of the fusee, and thus a greater leverage was obtained by the spring, accurately compensating for the loss of energy due to its uncoiling.

There must have been hundreds of disappointments before the difficulty was solved, and although many years of patient study and careful work must have been expended over this problem, we are able to dismiss it in a few lines of print! Yet we may profitably pause to admire the ingenuity of the device, which made portable clocks and watches practicable, for in millions of watches made every year, the barrel and fusee are incorporated.

The Compensating Balance

In the earliest watches a small wheel was used in place of a pendulum. Its regular motion allows the mainspring to unwind a little at equal intervals in exactly the same manner as the pendulum allows the weight to fall a little at each swing in the heavier types of clocks. The difficulties of differences in temperature were overcome by Thomas Earnshaw, who invented the compensating balance. This uses the unequal expansion of different metals in an ingenious manner so as to keep the leverage of the rim of the wheel constant.

Zech's first clock is now in the possession of the Society of Antiquaries of England. It is inscribed in Bohemian "Made in Prague by Jacob Zech in 1525," has a spring as motive power with barrel and fusee, and is the oldest portable clock in existence.

Clocks and clock-making is indeed a romantic subject, and one that provides a very profitable field for ingenuity and inventiveness. Unfortunately, considerations of space forbid our describing any of the many famous clocks in this issue, but I hope in one of our future issues to briefly describe Big Ben and one or two other famous clocks.

(THE END).

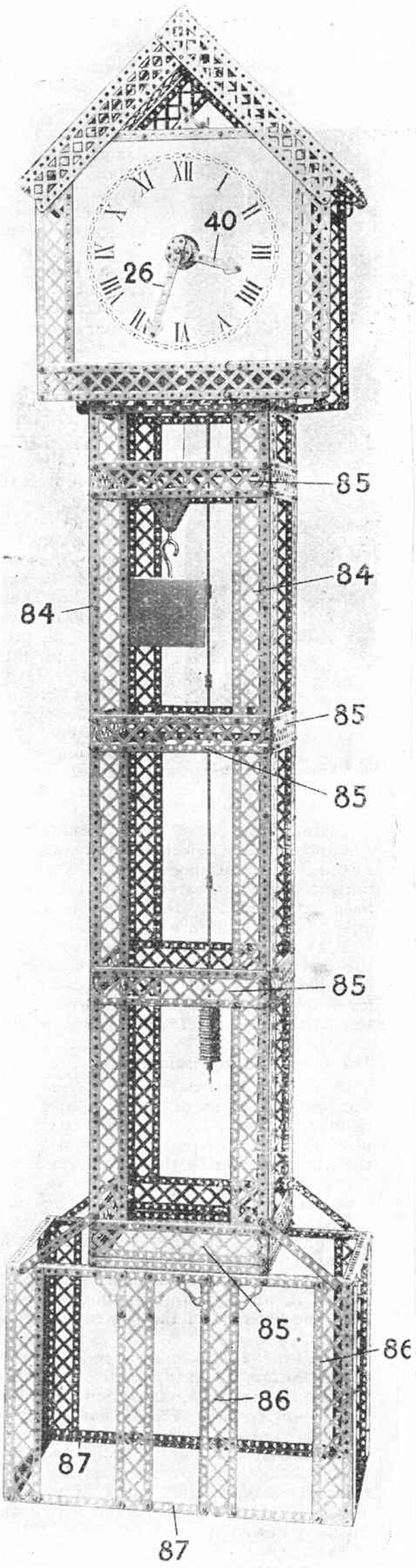


Fig. G. The Meccano Clock

Full Instructions for Building the

MECCANO CLOCK

PART II.

IN the first instalment of this article, which appeared in our November issue, instructions were given for the assembly of the Frame, Main Gear-Train, etc. The following details complete the instructions for building this remarkable model, which stands well over 6 ft. in height and keeps perfect time.

The Meccano clock is a triumph of model building, and with the exception of the 17 lb. weight, the wire by which it hangs (60 Fig. M), the cardboard face, and the light spring (80 Fig. B), it is made entirely from Meccano.

Non-Slipping Device

Having assembled the Ratchet-Winding Mechanism and the element shown in Fig. F*, a 57-toothed gear wheel (57 Fig. M) is passed over the rod and bolted thereon, and a collar (58) is bolted outside the gear wheel (57). In order that the gear wheel (57) may not slip on the rod (43) when taking the whole of the strain in winding the heavy clock weight, a flat (59 Fig. E*) is filed on the rod in the correct position for being engaged by the screw of the gear wheel (57). This gives the wheel a secure grip on the rod.

Winding the Clock

A stranded wire cord (60) is wound on the wood roller (44) and passes round a pulley (61) in the pulley block (62). This is made up of two 2½″ triangular plates bolted together with double brackets, and carries the 1½″ pulley wheel (61). The other end of the cord (60) is hooked (at 64) over the rod (63).

After the wood roller (44) has been inserted in place, another collar (66) is secured on the extreme end of rod (43). The clock is wound by a crank handle (65) provided with a ½″ pinion (not visible in the photograph), which engages the gear wheel (57). The roller (44) drives the main gear train, by reason of its gear wheel (51) engaging the first gear (15) of the train.

The Escapement Wheel and Pallet

Next, proceed to construct the escapement, which consists of an escapement wheel and a pallet mechanism. The former (Fig. H) consists of a face plate (66a) to which are attached eight reversed angle brackets (67). In order that these shall not move, they are pressed hard against the circular edge of the plate, and then bolted in position with washers (68) beneath the bolt-heads.

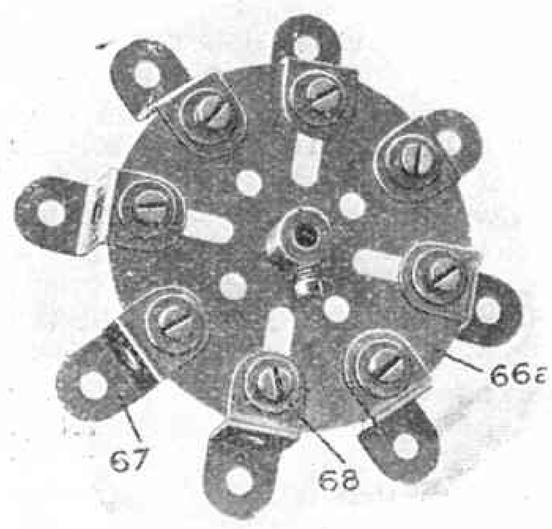


Fig. H. Escapement Wheel

The pallet mechanism (Fig. J) consists of two 2½″ reversed curved strips (69) with the web of a crank (70) bolted between. Angle brackets (71) are bolted in the end holes of the curved strips which form the pallets. The crank (70) is bolted on a 6″ rod (72, see Fig. B*) and a 5″ rod (74) is secured to a coupling (73) on the end of the rod (72). At the lower end of this is a coupling (75) carrying two 2″ rods (76) which engage on each side of a bush (77) on the pendulum rod (78).

The Pendulum

As shown in Fig. K, the pendulum consists of four 11½″ (78, 78a, 78c, and 78d) and a 5″ rod (78b) connected by couplings. As also shown in Fig. K, the pendulum is connected to the lower end of the 11½″ rod (78) (see Fig. B).

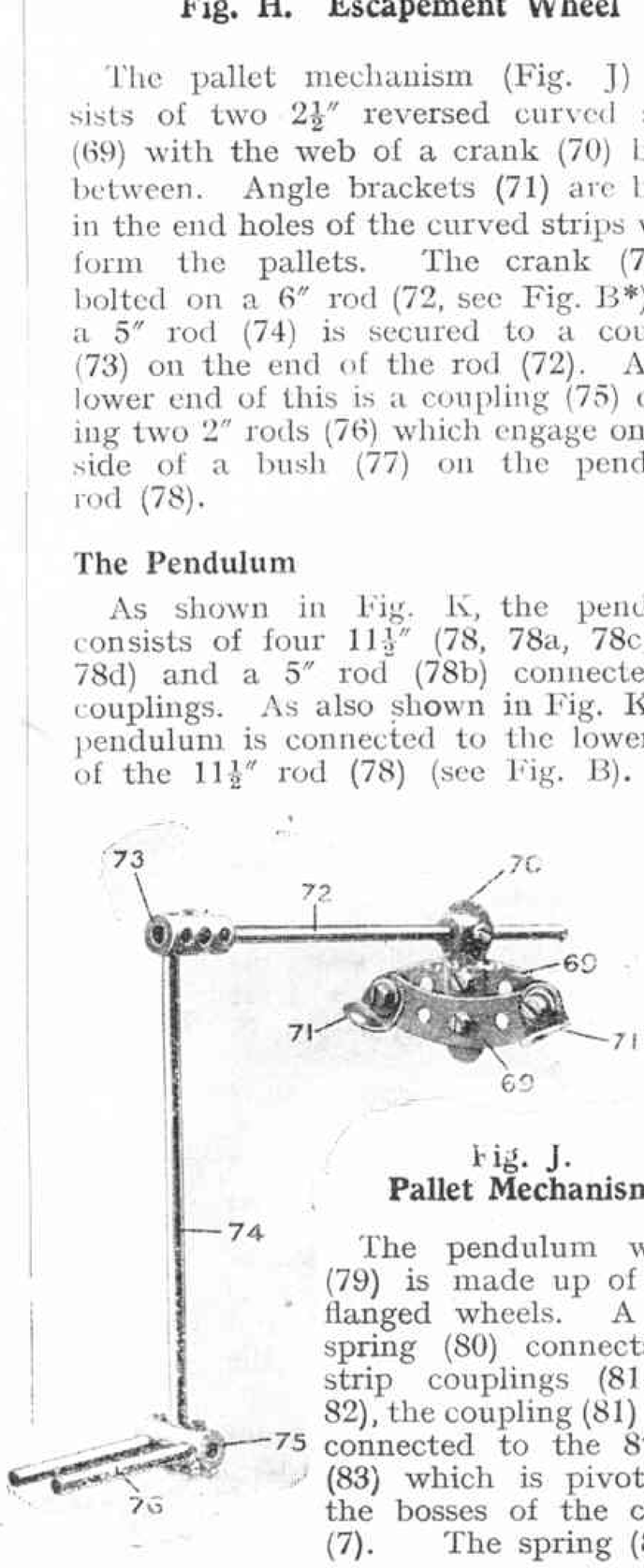


Fig. J.
Pallet Mechanism

The pendulum weight (79) is made up of eight flanged wheels. A light spring (80) connects the strip couplings (81 and 82), the coupling (81) being connected to the 8″ rod (83) which is pivoted in the bosses of the cranks (7). The spring (80) is

* Illustrated last month.

necessary in order to provide for an easy escapement movement of the pendulum.

Constructing the Main Frame

The main frame may now be built. This consists of two 24½″ angle girders at each vertical corner, overlapped three holes. To these are secured 12½″ braced girders (84) connected by 9½″ horizontal braced girders (85). The base consists of 12½″ vertical braced girders (86) and horizontal 18½″ angle girders (87), at the front and back.

The construction of the head of the clock will be clearly seen from Fig. L. It is built up of 12½″ angle girders (88) front and back, while 9½″ angle girders (89) connect the front and back girders. The feet of the vertical angle girders (Fig. A*) of the works casing are bolted by the bolts (91) to the 12½″ angle girders (90). These rest on the top of the side angle girders of the main frame (Fig. A*).

The dial should be attached and then the works casing placed in position from the rear. The hour and minute hands are then secured in place at the front of the dial and the model is complete.

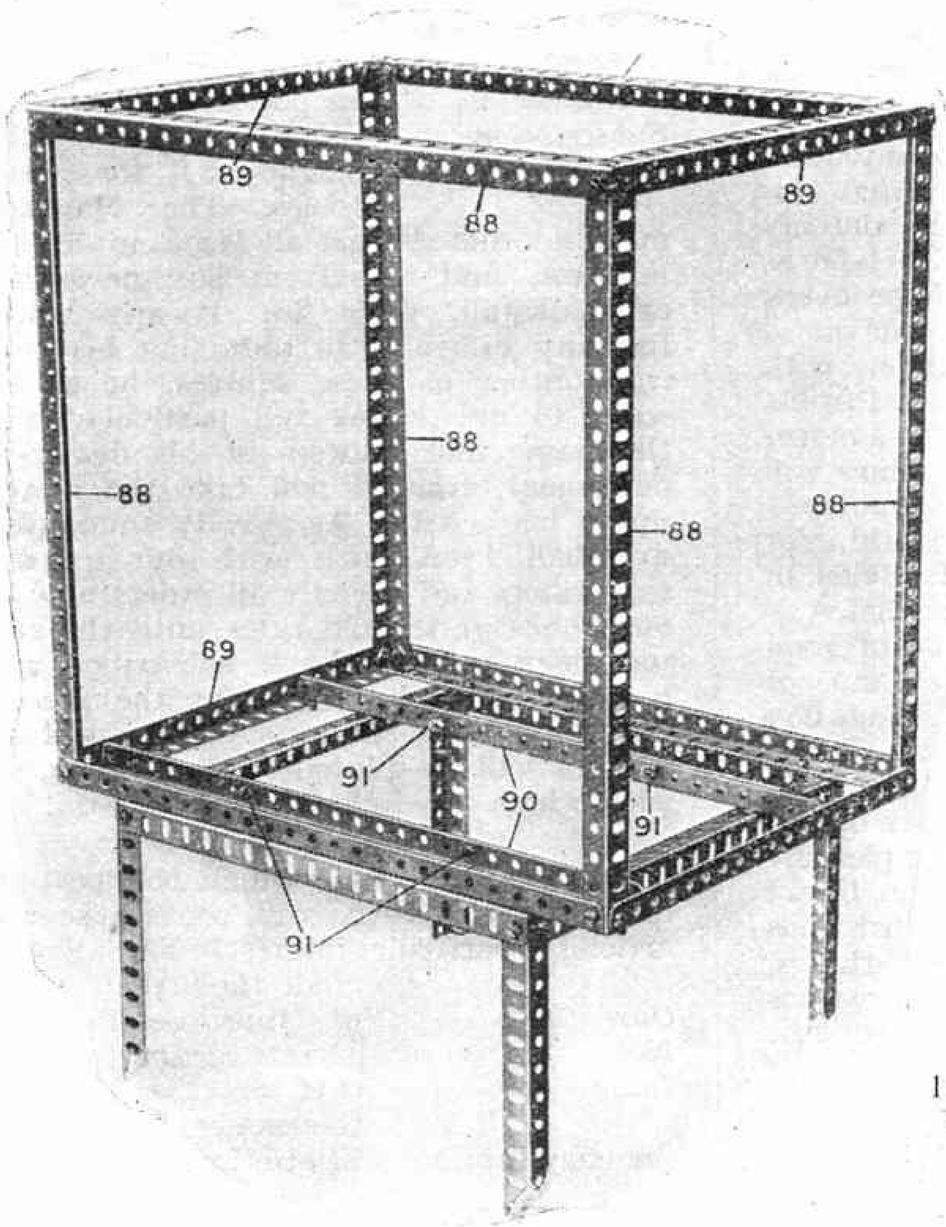


Fig. L. Clock Head

The Complete Instructions

The Meccano clock is a very interesting model to build and one that will always command admiration. During the past twelve months a large number of these clocks have been constructed in the Meccano model-building department and have been tested-out very thoroughly. With careful adjustment every clock has been made to keep perfect time. The construction of the clock is not difficult, and we hope that our readers will set to work and build this instructive model right away.

Complete instructions are being prepared in the form of a beautifully-printed and fully-illustrated leaflet, full particulars of which will be announced in the "*M.M.*" when ready. In the meantime if any readers wish a copy of this leaflet to be sent them, they should send their names and addresses, together with 4d. in stamps. Their names will be placed on a waiting list, and they will receive copies of the leaflet immediately it is ready, which we anticipate will be in about two months' time.

THE END.

* Illustrated last month.

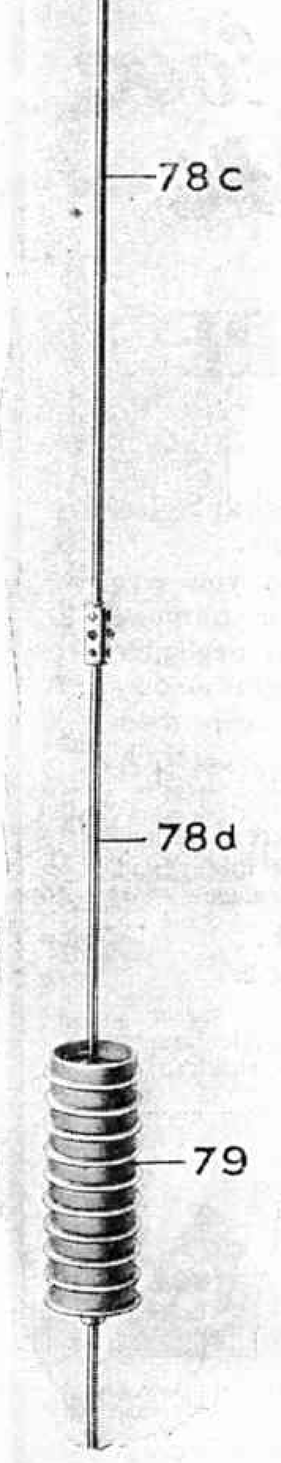


Fig. K. Pendulum

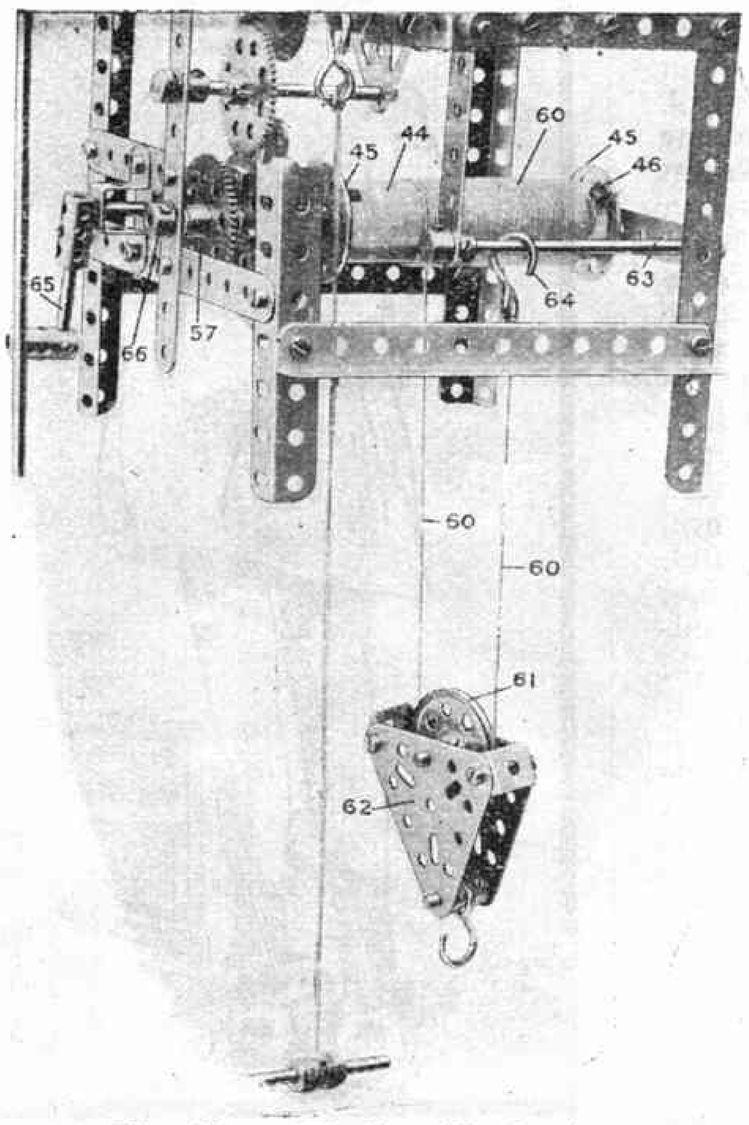


Fig. M. Winding Mechanism

Parts required for Clockwork Movement

1	Perf. Strip,	12½″
14	,, ,,	5½″
1	,, ,,	4½″
2	,, ,,	3″
1	,, ,,	2½″
1	,, ,,	2″
2	,, ,,	1½″
4	Angle Girders,	12½″
6	,, ,,	5½″
3	Double Brackets	
2	Angle ,,	
4	Axle Rods,	11½″
1	,, ,,	8″
2	,, ,,	6″
3	,, ,,	4½″
9	,, ,,	3½″
1	,, ,,	3″
1	,, ,,	2½″
8	,, ,,	2″
2	,, ,,	1½″
2	,, ,,	1″
10	Flanged Wheels	
1	Pulley Wheel,	1½″
3	Bush Wheels	
5	Pinion Wheels,	¾″
6	,, ,,	½″
8	Gear Wheels,	57 Teeth
5	,, ,,	50 ,,
1	,, ,,	38 ,,
1	Pawl	
106	Nuts and Bolts	
20	Washers	
1	Spring	
2	Double Bent Strips	
3	Hooks	
35	Collars	
6	Double Angle Strips	5½″ × ½″
4	Cranks	
9	Couplings	
2	Strip Couplings	
3	Flat Plates,	5½″ × 2½″
2	,, ,,	2½″ × 2½″
2	Triangular Plates,	2½″
2	,, ,,	1″
2	Curved Strips,	2½″
10″	Sprocket Chain	
2	Sprocket Wheels,	1½″
1	Wood Roller	
1	Face Plate	
2	Bolts,	¾″
9	Reversed Angle Brackets,	½″ × ½″
2	Trunnions	
1	Flat Trunnion	
1	Boss Bell Crank	
10 ft.	Flexible Steel Wire	
1	Face	

Parts required for Clock Case and Frame

51	Braced Girders,	12½″
24	,, ,,	9½″
8	,, ,,	3½″
8	Angle Girders,	24½″
4	,, ,,	18½″
14	,, ,,	12½″
14	,, ,,	9½″
4	Perforated Strips,	5½″
2	,, ,,	3½″
4	Architraves	
329	Nuts and Bolts	
8	Washers	
10	Angle Brackets	
1	17lb. Weight	

EDITORIAL

A VERY merry Christmas to all readers of the "*M.M.!*" I feel that this must be my first thought and my first words in this special Christmas number. I hope every reader will have a real jolly time, with plenty of fun and frolic. I shall think of you all on Christmas morning, and shall imagine the good times you are having in all parts of the country—indeed, in all parts of the world, for Christmas is one of the few festivals in which the world partakes as a whole.

Good Wishes

Christmas is not only a season of good times, but it makes tens of thousands of new friends for Meccano boys. Each boy who receives a Meccano Outfit as a Christmas present, joins our great brotherhood of boys; each becomes a member of our world-wide movement. What vast pleasure is in store for these new Meccano boys! What jolly times ahead! And on Christmas Day we shall all think of these things, and wish we might have a great Christmas gathering of all Meccano boys, with Mr. Hornby as Chairman, supported by the Guild Secretary and myself. Such a gathering is impossible, of course. We could not find any building in the world large enough to hold us all! Instead we must content ourselves with knowing that every Meccano boy this Christmas is, in thought, broadcasting to every other Meccano boy a message of good-will and friendship.

I hope you all like the special Christmas cover in which this number of the "*M.M.*" comes to you. The idea, which the artist has so beautifully carried out, occurred to me one day a few weeks ago when passing through our Shipping Department here in Liverpool. All around me were hundreds of packing cases of Meccano and Hornby Trains labelled and addressed, waiting for our motor lorries to take them to the docks for shipment to their destinations. Consignments of goods were being despatched to all parts of the world, and I felt so certain that readers of the "*M.M.*" would be interested to hear of the countries to which Meccano was being sent, that I made a list of the destinations on the crates I saw around me. Here it is:—France, Chili, India, Norway, Italy, Holland, U.S.A., Spain, East Africa, Argentine, New Zealand, Australia, Switzerland, Demerara, Bolivia, Smyrna, Denmark, Sweden, Canada, Belgium, Asia Minor, Morocco, Malta, Egypt, South Africa, China, Japan. Even this list of countries does not exhaust the countries in which Meccano is sold, of course, and it is a wonderful tribute to Meccano to find that boys all over the world want it. Some day I hope to tell in greater detail of the manner in which Meccano is shipped. How we have to look well ahead and in some cases ship orders for Christmas goods even during the Summer months, in order that they may reach their far-off destinations in time for the festive season! These and many other facts in connection with this important Department of our factory, will make interesting reading some day.

Sending Meccano World-wide

As mentioned in our last issue, in view of the increased size of the "*M.M.*," the price will be 2d. in future. Subscription rates for Magazines mailed direct from this office will be 1/6 for six and 3/– for twelve issues. The Magazine may be ordered from all Meccano dealers, however, and also from any newsagent or bookstall, price 2d. If any reader has any difficulty in obtaining his copy from either of these sources, he should write to me, giving full particulars and the name and address of his dealer or newsagent, when I will take the matter up on his behalf. As already announced, we shall keep faith with our existing subscribers and execute all orders now on our books at the old rates until the subscriptions expire. Each subscriber will, however, be debited 3d. for the present Christmas number, including postage. A note will be placed in each magazine with which any subscription runs out.

Increased Subscription Rates

Our January issue, which will be published on the 10th, will contain several articles of particular interest. These will include the first of a series of four dealing with Giant Steam Shovels that do the work of thousands of men. The January number will also include the first instalment of "*A Remarkable Engineering Feat*," Puzzles, Competitions, and many other good things. We print only sufficient magazines to fill the orders on our books, and for the last three months there have been many disappointments, owing to our being "sold out." If you have not already done so, place a regular order for the "*M.M.*" to-day, either with this office, or from your Meccano dealer or local newsagent.

Our Next Issue

Many outside firms are now using the pages of the "*M.M.*" for their advertising. I hope that every reader of the "*M.M.*" will patronise those firms who advertise in our pages, and whenever possible will make his purchases from them. When ordering goods or requesting catalogues it will help considerably if readers will mention to the firms concerned that they saw their advertisement in the *Meccano Magazine*. That will encourage our advertisers to continue to use our pages, and this in turn will enable me to enlarge the "*M.M.*" even further.

Support our Advertisers

IMPORTANT NOTICE

We are constantly asked to supply back numbers of the "*M.M.*" We print only sufficient copies to fill our regular orders, and back numbers cannot therefore be supplied. In order to prevent disappointment our readers are advised to place a regular order, with a Meccano dealer, a newsagent, or direct with us.

Educate the Kiddies to love good Furniture—

Period

DOLL FURNITURE

Scale Model

British made

to an exact scale in modern or Old English Styles, and faithfully representing the real article.

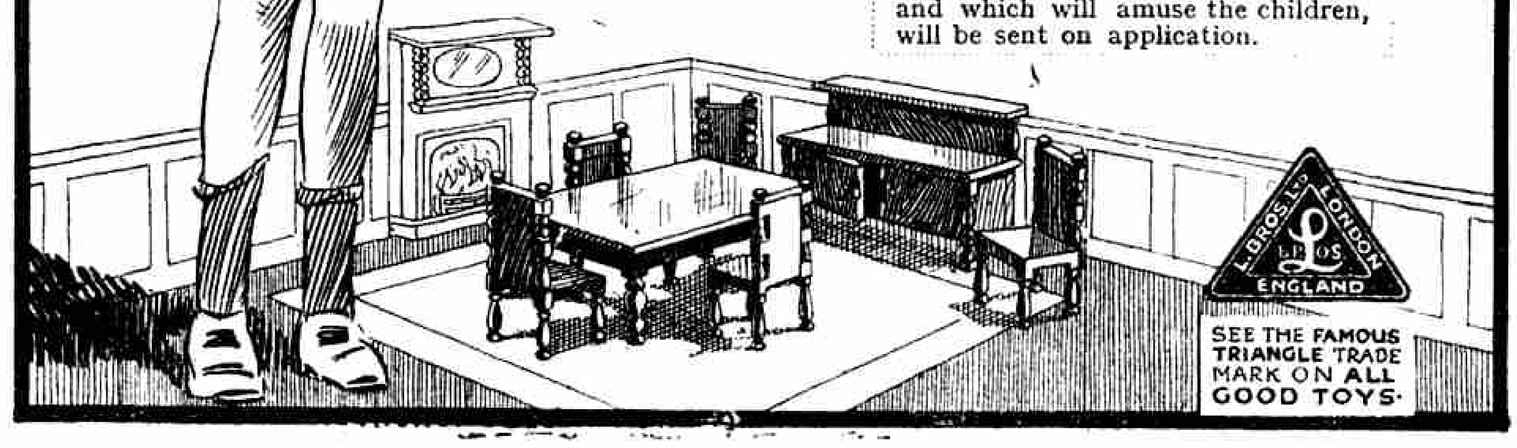
What better Christmas Presents could you give them than sets of this beautifully-made furniture for the Doll's House? The expense is negligible when you consider the hours of innocent amusement it will give them—and it will keep them out of mischief, too! Each Set packed carefully in a strong box 11 in. × 11 in. × 2½ in.

9/6 per set. There are four different sets.

If unobtainable locally, furniture will be sent direct, and necessary arrangements made with nearest dealer.

LINES BROS. LTD.,
9, FORE STREET, LONDON, E.C.2.

FREE A descriptive folder giving fuller particulars, and which will amuse the children, will be sent on application.



L. BROS. LTD. LONDON LBOS ENGLAND

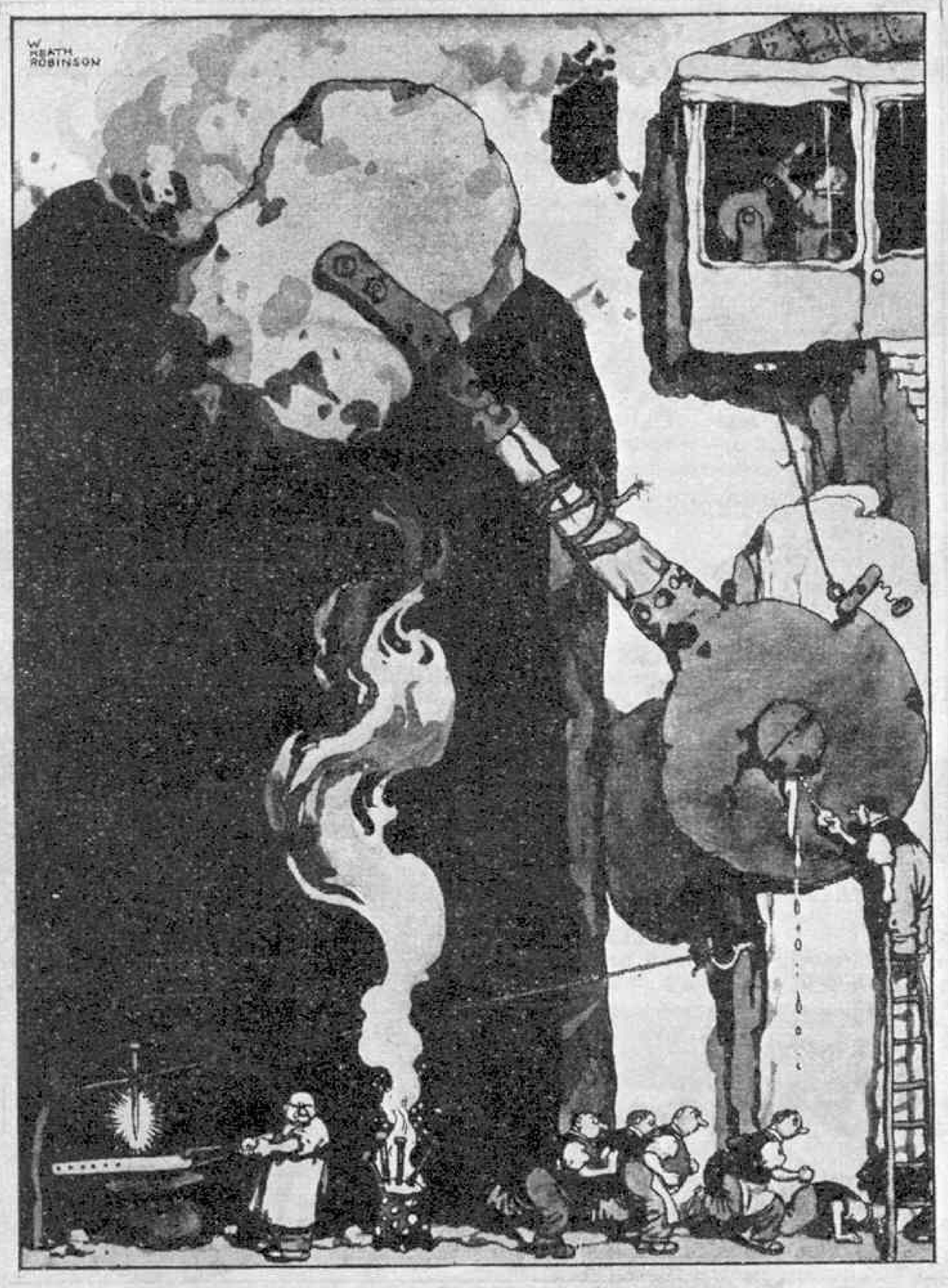
SEE THE FAMOUS TRIANGLE TRADE MARK ON ALL GOOD TOYS.

TESTING THE STRENGTH OF A NEW MODEL

TESTING A MECCANO PERAMBULATOR

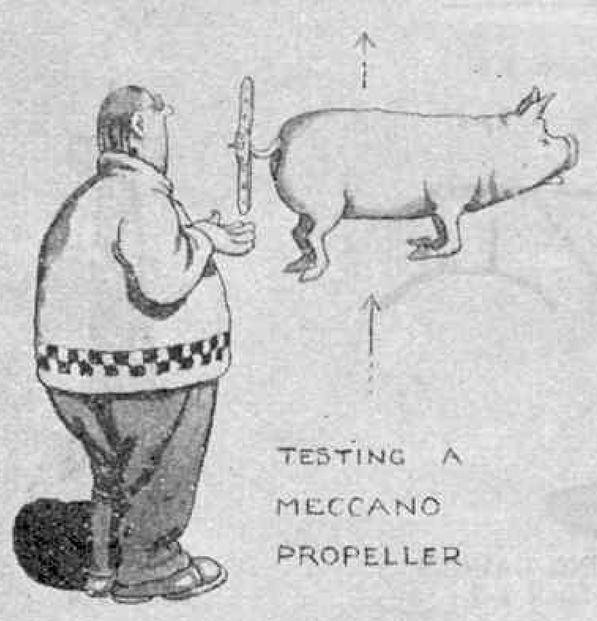
TESTING A MECCANO ROCKING CHAIR

THE MECCANO HOLER AT WORK

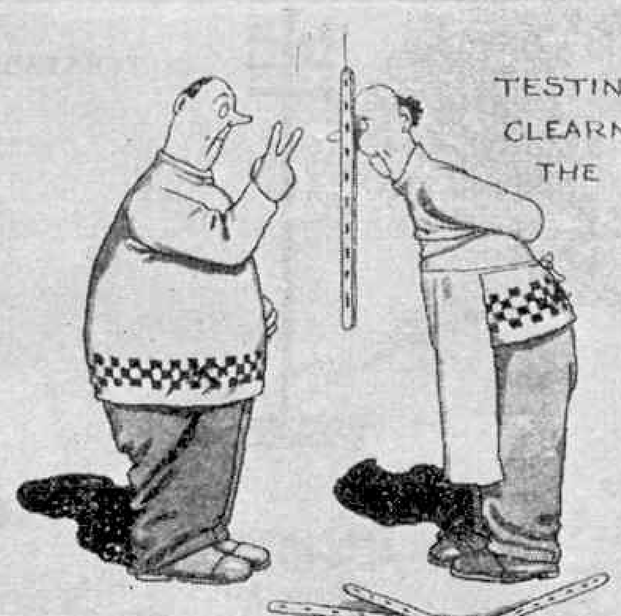


THE ARDUOUS WORK OF THE MECCANO HOLE COUNTER

MECCANO TRUCK TESTING



TESTING A MECCANO PROPELLER



TESTING THE CLEARNESS OF THE HOLES

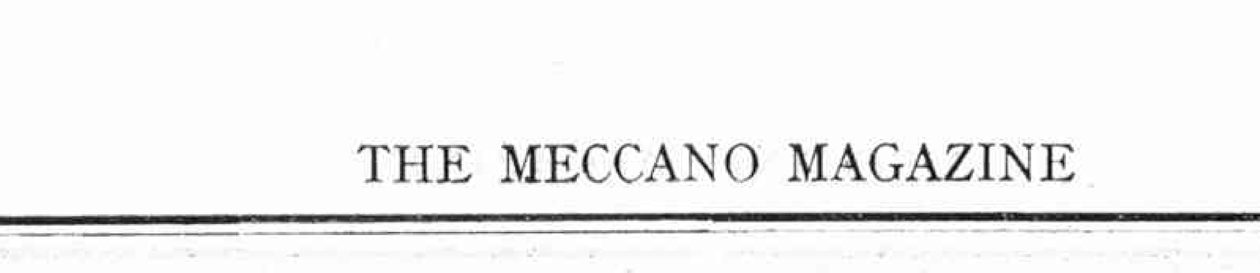
Mr. Heath Robinson's idea of how Meccano is made and tested.

New Rolling Stock and Accessories

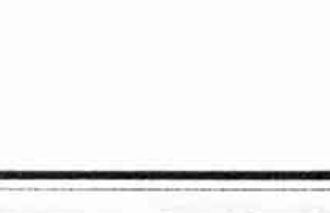
THERE are new Wagons, Signals, Lamps, Stations, Turntables this year, all built in correct proportion to the size, gauge, method of coupling, etc., of the Hornby Trains. Most important of all they have the uniformly beautiful finish which is the great feature of the Hornby system. To use cheap-looking rolling stock or a foreign-looking station with a Hornby Train completely spoils the effect.

THE WINDSOR STATION is a thing of beauty—the only really British station obtainable. Its bright colouring and realistic appearance will bring joy to the heart of every boy who sees it.

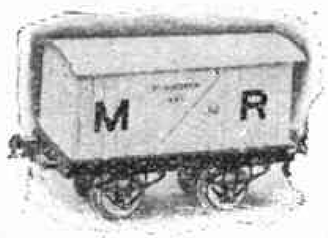
BRAKE VANS
Finished in colour.
Each **4/6**



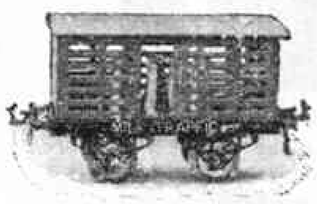
WINDSOR STATIONS
Excellent models, beautifully designed and finished.
Dimensions: Length 2 ft. 9 in., breadth 6 in., height 7 in. Each **12/6**



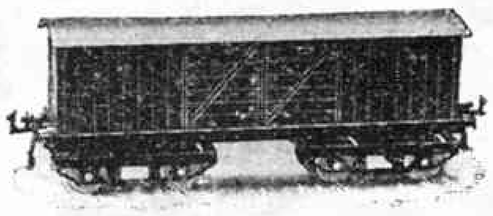
No. 1 LUGGAGE VANS
Letter M.R. Representative colours.
Each **4/6**



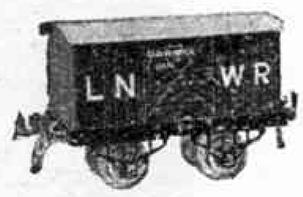
REFRIGERATOR VANS
Enamelled in white, lettered black. Each **4/6**



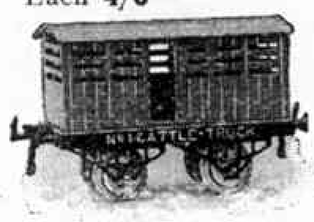
MILK TRAFFIC VANS
Fitted with sliding door, complete with milk cans. Each **5/–**



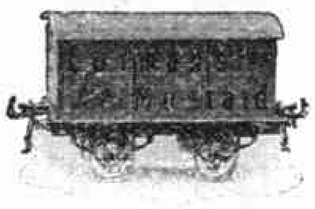
No. 2 LUGGAGE VANS
Finished in colour. Fitted with double doors.
Suitable for 2 ft. radius rails only. Each **7/–**



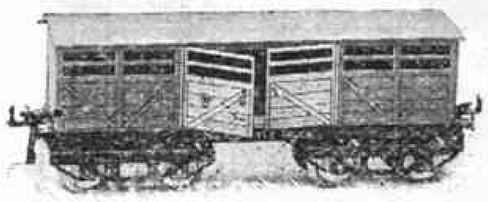
GUNPOWDER VANS
Finished in red.
Each **4/6**



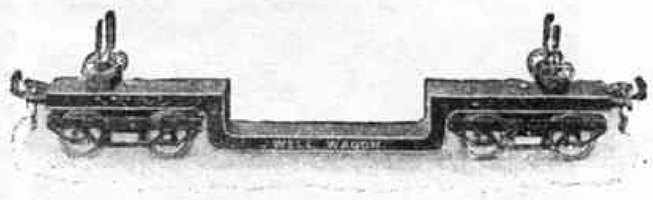
No. 1 CATTLE TRUCKS
Fitted with sliding door,
Very realistic design.
Each **4/6**



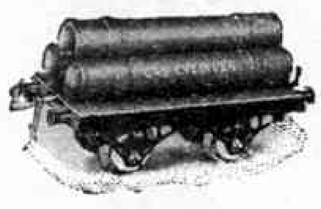
COLMAN'S MUSTARD VANS
Finished in colour.
Each **4/6**



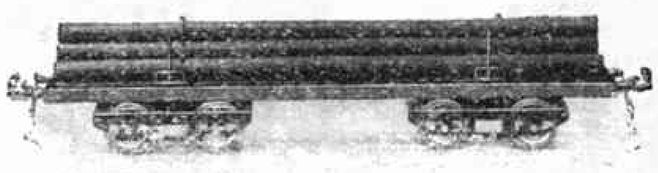
No. 2 CATTLE TRUCKS
Splendid models, fitted with double doors.
Suitable for 2 ft. radius rails only. Each **7/–**



TROLLEY WAGONS. Finished in colour.
Suitable for 2 ft. radius rails only. Each **6/6**

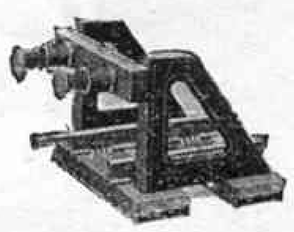


GAS CYLINDER WAGONS
Finished in red, lettered gold.
Each **4/–**

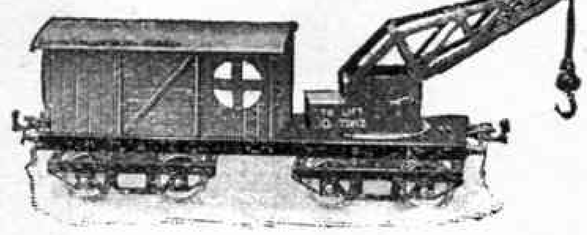


No. 2 LUMBER WAGONS
Fitted with bolsters and stanchions for log transport.
Suitable for 2 ft. radius rails only. Each **5/6**

No. 1 LUMBER WAGONS
Fitted with bolsters and stanchions for log transport. Each **2/6**

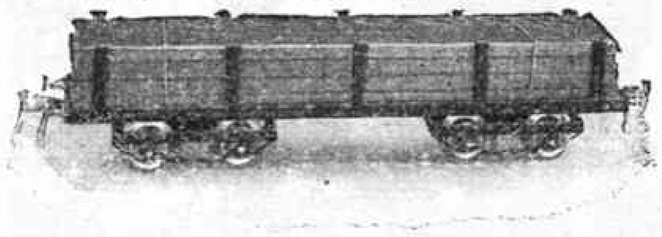


SPRING BUFFER STOPS. Each **2/–**

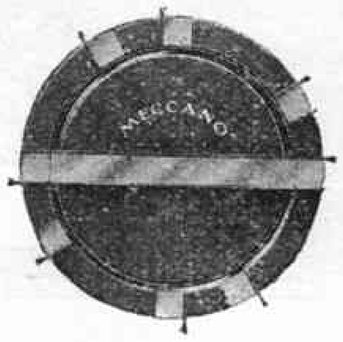


BREAKDOWN VANS AND CRANES
Excellent finish. Beautifully coloured.
Suitable for 2 ft. radius rails only. Each **7/–**

No. 1 TIMBER WAGONS
Beautifully enamelled in colour and stoved. Each **2/–**

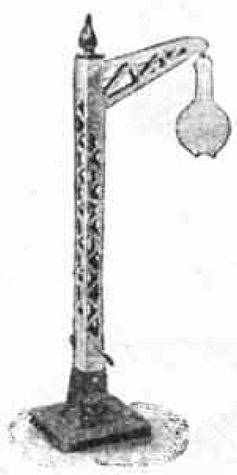


No. 2 TIMBER WAGONS
Beautifully enamelled in colour and stoved. Suitable for 2 ft. radius rails only. Each **5/6**



TURNTABLES. Each **4/6**

ROTARY TIPPING WAGONS
Finished in colour.
Each **3/6**



SINGLE LAMP STANDARDS
A four-volt bulb may be fitted into the globe.
Each **3/–**

DOUBLE LAMP STANDARDS
Four-volt bulbs may be fitted into the globes.
Each **4/–**

TELEGRAPH POLES
Each **3/–**

LOADING GAUGES
Each **1/9**

SIGNALS
Each **2/6**

MECCANO LIMITED **BINNS ROAD** **LIVERPOOL**

Into the Land of Fun

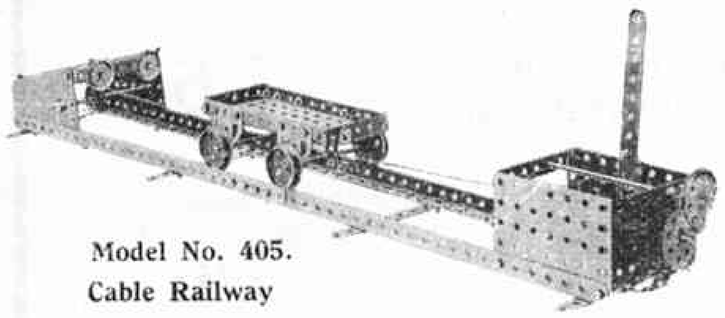
by

"SPANNER."

THERE are over a million boys to-day who regard Meccano as being the most fascinating hobby in the world. During my travels I have met many thousands of these boys, and I have been compelled to notice how full of enthusiasm and praise they are for everything that comes from Meccanotown.

Often during these dark December nights as I sit by the fire I like to think of these boys in all parts of the country. I think of them bringing out their well-worn boxes of Meccano and having real jolly evenings with their Outfits. They don't care whether it is raining or snowing, for their minds are away in the wonderful realms of engineering, planning wonderful structures or intricate mechanisms of iron and steel.

The boys I know never seem to come to the end of their Meccano fun, for somehow or other, no matter how many models they build, there always seem to be others ahead. One of them told me the other day that he thinks there are enough models illustrated in the Meccano Manuals to keep any boy busy for a couple of years! I quite agreed with him, but even when all these models have been constructed there are hundreds more to be thought out. Then, too, there are numbers of fascinating experiments to be made, improvements in existing models to be effected, or new ideas to be tried out.

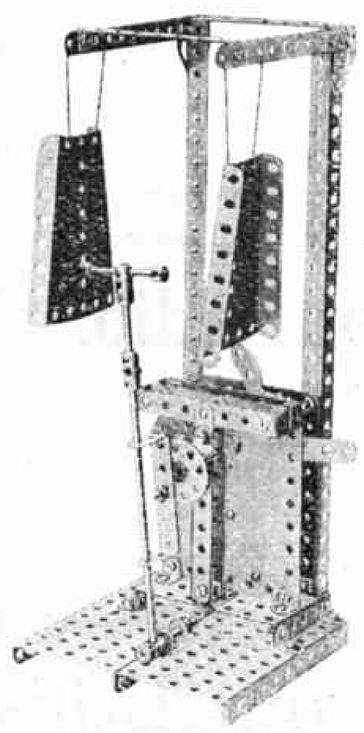


Model No. 405.
Cable Railway

I do not believe that there are many boys who build the same models more than once, because they always wish to "go one better," and having built a model they pass on to more complicated models. And when the models within the range of their Outfit have all been built it is a simple matter to add an Accessory Outfit, and the building power of the Outfit becomes enormously increased at once.

Some years ago I used a No. 4 Outfit and I have many pleasant memories of the good times I had with this Outfit. Though I used it every day, I never seemed to come to the end of the different models I could build with it. Looking through the pages of the new Complete Manual, I feel that I should have had even more enjoyable times if that Manual had been published then! In its pages all manner of new mechanical devices are shown, and the models have been so improved that some of them are quite unlike their predecessors in the former manuals, although bearing the same names.

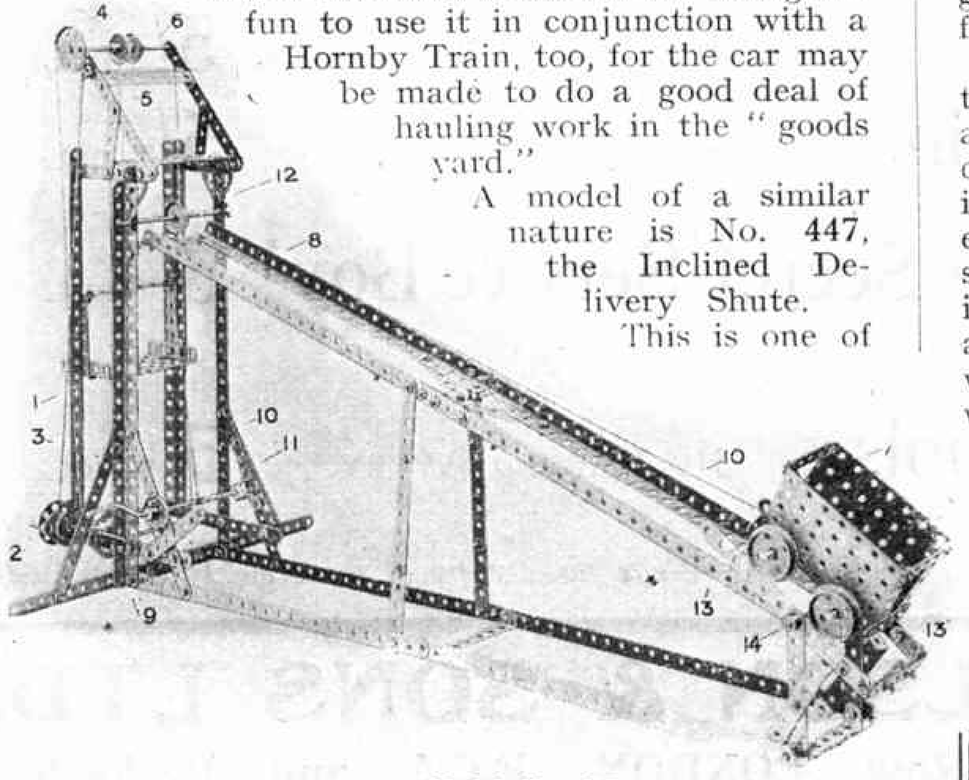
I like those models that continue to amuse after they have been built—the working models, I mean.



Model No. 413.
Automatic Gong

One, which a No. 4 Outfit builds, is No. 405, the Cable Railway, with which I have amused myself for hours on end. Unfortunately it is not possible to do justice to this model in a small illustration, but you may take it from me it is one of the most entertaining models in the book. Only one section of rails is shown in the illustration, but these may be extended to any length desired. The model may be worked by a Meccano electric or clockwork motor, through a belt, which is passed around the $1\frac{1}{2}$" pulley. This drives through a clutch mechanism and pinion and gear wheels to the lower spindle on which the driving pulley is fixed. The driving cord passes over this pulley and over the second pulley at the other end of the railway, as shown in the illustration. A point to be remembered is that in fixing the lever for operating the clutch mechanism, the nuts should be locked to prevent the screw from working out. Hours of fun may be spent with this model, hauling goods from one side of the room to the other. It is great fun to use it in conjunction with a Hornby Train, too, for the car may be made to do a good deal of hauling work in the "goods yard."

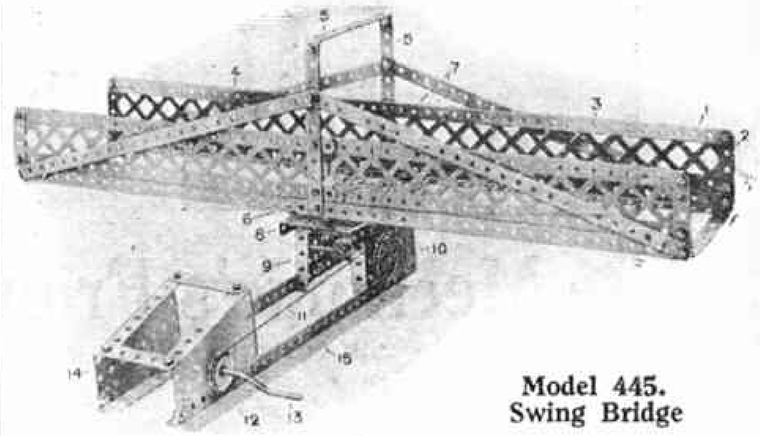
A model of a similar nature is No. 447, the Inclined Delivery Shute. This is one of the many models that have been greatly improved in the new Manual. The model works by gravity, the wagon running on an inclined plane. A hand wheel (on the left of the illustration) raises the cage and a crank handle enables the wagon to be drawn up the incline. When the truck reaches the top, the load is transferred from the cage to the truck, which then runs down the incline, its speed being controlled by a hand brake. When the end of the rails is reached the truck runs on to two pivoted $5\frac{1}{2}$" strips, which are depressed by the weight and the truck thus automatically tips its load.



Model No. 447.
Inclined Delivery Shute

Model 413, Automatic Gong, will be useful for calling the family to Christmas dinner and other meals. It makes quite a respectable noise and may be operated by a string attached to the clockwork starting lever.

Bridges are always interesting to all Meccano builders, and Model No. 445, Swing Bridge, illustrated here, is a very clever example and one that won a prize in one of the recent competitions. This type of bridge is to be seen all over the country and is particularly common in Holland, where it is usually placed over the canals. When barges or ships wish to pass, the bridge is swung round on to the land, leaving the canal clear. The sides of this model are made of braced girders secured to upright strips and reinforced by inner



Model 445.
Swing Bridge

strips. Diagonal strips brace the side girders to the top structure, thus forming a stay for the sides. The swing base of the bridge is composed of a 3" pulley wheel, bolted to two cross $5\frac{1}{2}$" strips, which in turn are secured to the main base side girders. The bridge swings on the perforated plate on a short rod.

Those who own a Hornby Train will find this model very interesting, for it may be arranged to take the track across a "valley" or "river." Of course it adds to the fun if the bridge is worked by a clockwork or electric motor. In my own model railway system I had one of these bridges working in this way. It took one line of rails across another track, and I arranged it to operate with a Meccano electric motor. This was worked from a distant signal box, by switching on the current, and many times my Hornby Express only narrowly escaped disaster by the bridge not being opened in time! Those were exciting days indeed! Once my kitten nearly got electrocuted by becoming entangled in the wires—but that is another story!

NEXT MONTH

More No. 4 Models.

NELSON BOOKS for BOYS

Engineering for Boys. 6/- net.

By ELLISON HAWKS, Editor of the *Meccano Magazine.*

Nearly 400 pages are packed with just that kind of information that Meccano boys want, while there are over 100 pictures from unique photographs of marine engines, liners, warships, docks, lighthouses, locomotives, bridges, dams, canals, engineering shops and machinery, generating stations, etc., beautifully printed on plate paper, besides many text cuts. Boys who wish to become engineers will be specially interested in the chapter "The Making of an Engineer," which will enable them to decide which branch of engineering they will take up.

"A mine of information for the boy who intends to become an engineer."—*Yorkshire Observer.*

"The many photographs and drawings are admirable."—*Evening Dispatch.*

The Romance and Reality of Radio. 3/6 net.

By ELLISON HAWKS, Editor of the *Meccano Magazine.*

This book brings together, in one cover, a brief account of the History, Theory and Practice of Wireless Telegraphy and Telephony from the early experiments of Morse to the wonderful trans-oceanic Radio communication of to-day.

It shows the beginner that Radio is one of the most fascinating of sciences, and as a hobby, a pleasant and instructive pastime. Fully illustrated with plates and text cuts.

"Lucid . . . helpful and practical information . . . distinctly to be recommended."—*Birmingham Post.*

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By G. GIBBARD JACKSON.

Every boy is tremendously interested in railways, and this book is so full of information, so clearly written, so plentifully illustrated, that it is assured of a widespread welcome. The author knows his subject from A to Z and has had the help of the chief mechanical engineers and superintendents of the line of the great railway companies. Nearly 120 pictures from photographs on plate paper, besides many text cuts.

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"Most fascinating . . . tells the average boy just what he wants to know about railways."—*Court Journal.*

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Hints, Data, Suggestions, Recipes, Instructions on many Subjects. Useful information of interest to mechanics, professional and amateur.

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By JOHN BUCHAN. With Illustrations and Maps.

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The school adventures of no ordinary boy.

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By LORD FREDERIC HAMILTON.

A thrilling story of exciting adventures by sea and land.

Between Two Schools. By HAROLD AVERY. 5/- net.

A capital school yarn by a favourite author.

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OUR BOOK-SHELF

Readers frequently write to me asking if I can recommend books that are both of interest and of use. In this column I review books that I consider specially appeal to Meccano boys. I do not actually supply these books, which may be obtained either through any bookseller or direct from the publishers.

EVERY year hundreds of new books are published, dealing with almost every subject under the sun. A hundred years ago it was difficult to obtain any books, other than those dealing with certain subjects, and often these subjects were "as dry as dust" and of no interest to anyone but the writers of the books themselves. To-day, however, all this is changed, and it would be difficult to find any subject on which some book has not been written. In this respect we are fortunate in living in an enlightened age. No matter of what we may wish to read—whether it be of ancient nations, of our work, hobbies, or even of our dreams—there are dozens of books that will give us information on the subject desired. We read for our living; and we read for our pleasure. It is impossible for us to imagine a world without books.

The Editor knows that readers of the "*M.M.*" are particularly fond of books. He also knows that it is impossible for anyone to read more than a fraction of the books that have been published. Much time may be wasted in reading books that do not matter, and we strongly urge every reader of the "*M.M.*" to choose very carefully the books that he reads. If you like fiction, read only good, clean stories of adventure or of school life. Do not read trashy stories of the "blood-and-thunder" type. They may be exciting but they do no good, and to read a book from which we learn nothing is a waste of time.

In this monthly column we describe only the best type of books, and no reviews will be found of books unsuitable for readers of the "*M.M.*" You may with safety choose any of the books mentioned here, or in our advertisement pages. Any book that does not conform to the high standard we have laid down, finds no space in these pages.

Robinson Crusoe
by Daniel Defoe
(*Pub. by Religious Tract Society, London. Price* 6/-).

This is a new edition of Defoe's masterpiece, the hero of which needs no introduction. Robinson Crusoe and his adventures are immortal and appeal to every generation of boys. The present edition is printed from new type and completely re-illustrated by Stanley L. Wood, who, as a result of careful study, has dealt with the subject in a distinctive manner. It is interesting to find that the edition includes part two, so often omitted in recent issues, and many of the illustrations depict scenes very seldom pictorially treated.

Engineering for Boys
by Ellison Hawks
(*Pub. by T. C. & E. C. Jack. Price* 6/-).

In his preface the author of this book writes:—"Every year I receive thousands of letters from boys, nearly all of whom are interested in Engineering . . . above all, every boy wishes to know how to become an engineer. . ." Such a book was wanted—and here it is. As Editor of the "*Meccano Magazine*" Mr. Ellison Hawks has greater opportunities for studying the mind of the boy than any other writer. Moreover, he knows how to allay the thirst for interesting knowledge possessed by every boy, wisely and to useful ends.

Ancient Engineering, Power, the Invention of the Steam Engine, Turbines, Railways, Breakwaters, Docks and Harbours, Lighthouses, Tunnels, Ships, Canals, Roadmaking, Bridge-building and Famous Bridges, are written of with a sure touch. All that is fascinating and informative in them is revealed in a striking manner, and every one of the 389 pages is packed with reading that will specially appeal to Meccano boys. Sixty-three half-tone illustrations, beautifully printed on art-paper, and 140 figures in the text, make everything clear. This book should be added to the private library of every Meccano boy. A.M.D.

The Boy's Own Annual
(*Pub. by The Religious Tract Society. Price* 12/6 *net.*)

Somehow or other Christmas would not seem complete without a copy of our old friend "The Boy's Own Annual." This year's volume is even bigger and better than its predecessors, and is full of real "live" stories of pirates, hidden treasures, school life and adventures. The stamp collector, naturalist, and model builder are not forgotten, and there are numerous excellent articles on these engrossing topics, all written by men with an expert knowledge.

The long stories are by such well-known and popular authors as Major Charles Gibson, Harold Avery, Charles Vivian, and there is not a dull page in this well-bound and profusely-illustrated volume.

Jack O' Langsett
by R. A. H. Goodyear.
(*Pub. by Nelson. Price* 5/- *net*).

This convincing school story of Blue Springs College and its pupils holds our interest from the time Jack is chosen to play for his second eleven until he finally becomes Captain of the School. When the Head decides to abolish all "caning and swishing," dire results are prophesied by the Blues, but they do not reckon with Mr. Smethwick, the new sports Master, who always manages to have the last word, which usually takes the form of "impots," There are many exciting incidents in the tale, chief of which are the Great Fire in Canvas City, and the wonderful game in which Jack saves Blue Springs College from defeat and gains his cricket colours.

Careers for Our Sons
by D. W. Hughes
(*Pub. by A. & C. Black Price* 5/-).

"What shall I be?" "How can I become a success?" "What is an Engineer's work?" These and a thousand other questions are answered in this book. Everything you want to know about a life at sea, abroad, at home or in

(*Continued foot of next col.*)

the air, is clearly and interestingly told. The training necessary for any particular career, the examinations to be passed, and the pay and prospects, are all contained in this mine of information.

"How to Identify" Series.

The price of these books is 1/6 each, and not 1/9 as stated in this column in our October issue.

BOOKS RECEIVED

We have received copies of the undermentioned books during the past month, and these will be reviewed in this column in a future issue.

"CHILDREN'S COMPANION ANNUAL" ("Boy's Own Paper" Publishers), 4/6 net.
"THE MOTOR CYCLING MANUAL" (Temple Press), 2/- net.
"HANDICRAFTS FOR HANDY PEOPLE" (Educational Co. of Ireland Ltd.), 3/-
"LOST ON DU CORRIG" *by* S. O'Grady (T. Fisher Unwin), 5/- net.
"THE RADIO AMATEUR'S HANDBOOK" *by* A. F. Collins (Harrap & Co. Ltd.), 7/6
"THE BOY'S BOOK OF MODEL AEROPLANES" *by* Collins (Parsons & Co.), 8/6
"SOLDIER AND COWBOY" *by* Capt. G. Ash (Dranes), 3/6
"SHIPS OF THE ROYAL NAVY" *by* O. Parkes (Sampson, Lowe & Co. Ltd.), 2/6

Catalogues Received

We have received the following catalogues this month. Should any of our readers write to the firms concerned, they will assist us by mentioning the "Meccano Magazine."

Messrs. Lott's Bricks (Watford, Herts.) are issuing a sheet of prize-winning plans for building with their bricks—bricks that embody far more than the old-fashioned wooden blocks and pillars. This sheet contains instructions for building forts, villas, cottages, and a mill, giving ground plans, north and south elevation, etc., and full architect's plans in miniature. This sheet, price 1/-, is a wonderful help in a truly fascinating hobby. Other lists free on application.

* * * *

We have received Messrs. Gamage's (Holborn, London) Christmas Catalogue—and what a catalogue it is! For variety and interest it excels all previous years' lists. It contains page after page of suggestions for Christmas gifts and is a production to delight the heart of any boy. No matter what are our requirements, they are met in these pages. 168 pages of delight. Post free on request.

* * * *

Radio enthusiasts will find something new in the "Polar-Blok" catalogue (Radio Communication Co. Ltd., 34-35, Norfolk Street, Strand, London, W.C.2.) This system makes it possible to add valves to a crystal detector and to alter the circuit exactly as desired, and yet allows the set to maintain a smart and a finished appearance. This clearly-written book will be sent to any Meccano boy, price 3d. post free.

* * * *

Messrs. Nelson & Sons, of 35–6, Paternoster Row, London, E.C., publish an exceptionally attractive list this year. The range of new books is excellent, covering everything from fairy stories to popular science. The list is illustrated and conveniently arranged in sections. A sure guide to good literature and acceptable Christmas presents. Messrs. Nelson will be pleased to mail their catalogue free upon request.

* * * *

We have received interesting leaflets from the New Auto Scooter Co. (Chestergate, Stockport), giving details of six different models that will appeal to our younger readers. This enterprising Company are organising a special Essay Competition for Meccano boys, full particulars of which appear in our advertising pages.

* * * *

McCaw, Stevenson & Orr Ltd. (Linenhall Works, Belfast), send us a descriptive leaflet of Seccotine which we really don't need to read, because we know all about it! It sticks everything to everything and holds it there for ever! "Firmas" is another form of Seccotine for repairing articles that will afterwards be subjected to heat or are required to hold hot or cold water.

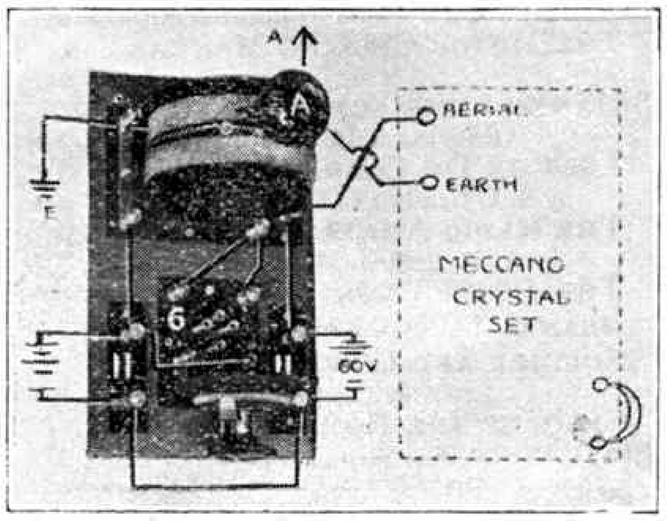
* * * *

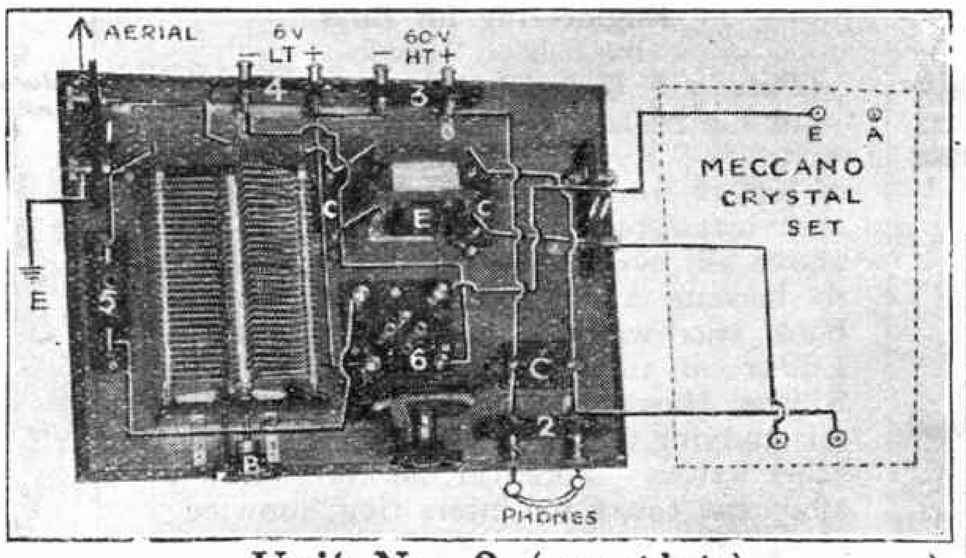
The Religious Tract Society (4, Bouverie St., E.C.), send us their booklet "*Books for Gifts.*" Most of the books listed are illustrated and shortly described, making it an easy matter to select a suitable volume for a present. Free on application.

* * * *

The Mullard Radio Valve Co. Ltd. (45, Nightingale Lane, Balham, S.W.12), send us lists of their well-known Valves and other Radio Accessories. The O.R.A. valve is, of course, known to all Radio users, and the firm is now introducing "Wecovalve," which requires no accumulators—just a dry cell. Double the life, and a fraction of the running cost of the older valves. For detecting, H. or L. frequency amplifying, this valve promises to be as successful here as in U.S.A. Lists free on application.

Unit No. 1 *(complete)*





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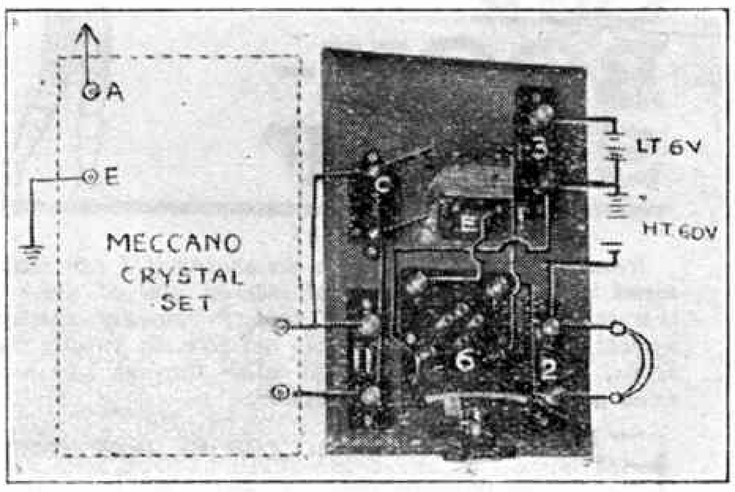
Unit No. 3 *(complete)*



If you have a MECCANO CRYSTAL SET here are three ways of improving it

TO INCREASE ITS RANGE

(See Unit 1)

As you know, boys, the Crystal Set is not much good for long distance work, although for use within 20 miles from a Broadcasting Station it gives splendid results. But there is a way to increase the range of the excellent Meccano Set to as much as 70 or 100 miles—even more under favourable circumstances—and that is by using a Valve in front of it.

Look at the illustration above, and note how easily with only four components you can build up Unit No. 1 and increase the range of your Set at least three times.

TO MAKE IT LOUDER

(See Unit 3)

No Crystal Set gives sufficiently loud speech to work a Loud Speaker, and as most of you at some time or another will want to entertain your friends in this way, we show you in Unit No. 3 how you can add to your Meccano Set an Amplifier which will give you speech five times as loud. For this Unit you only require components No. 2, 3, 7, 11, C, E, nothing could be easier.

PRICES AND KEY TO PHOTOS

1. A and E terminal strip ... ...10d.
2. TEL terminal strip 9d.
3. HT terminal strip ... 8d.
4. LT terminal strip ... 8d.
5. Single coil holder ... 1/3
6. Socostat (combined valve holder and filament resistance) 7/6
11. Output terminal strip 9d.

A. Variometer 7/3
B. .001 Variable condenser (assembled) 9/–
C. .001 fixed condensers 1/6
E. Max-Amp. Transformer 18/6

Rubber-covered connecting wire 2½d. per yd.

H. Fixing Brackets 1½d. each

TO INCREASE ITS RANGE AND MAKE IT LOUDER AT THE SAME TIME

(See Unit 2)

This method is a combination of Units No. 1 and 3, but only one Valve is used. The Circuit used in this set is known as a Dual Amplification Circuit, and is very similar to the famous "P.W." Circuit which you have no doubt read quite a lot about in "Popular Wireless."

Here again, you will be able to see by the illustration, exactly what components you need, but if you have any doubt, write to us and we will be pleased to tell you more.

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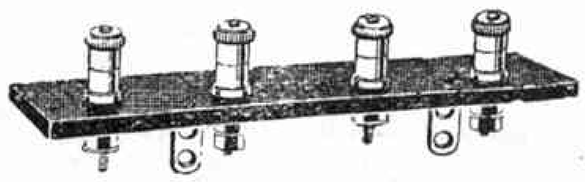
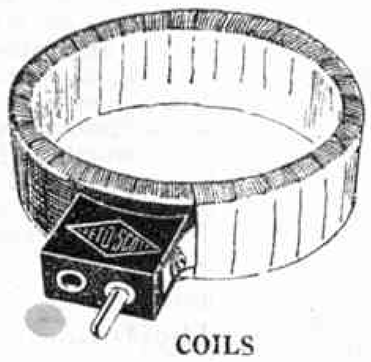


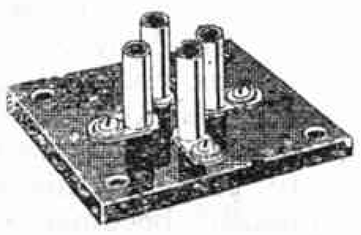
TERMINAL STRIPS

Sold in strips of 2 or 4. Engraved + HT—, + LT—, 'PHONES, price 8d. per pair of terminals. Ditto, but with telephone terminals throughout, 9d. per pair. Large ditto, engraved Aerial and Earth, Per pair 10d.



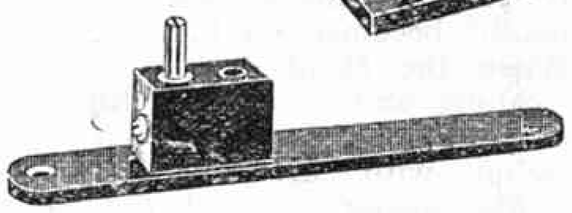
COILS

No.	Wavelength.	
1	290–390 mtrs.	2/–
2	340–470 „	2/6
3	420–650 „	3/–
4	570–900 „	3/6
5	780–1140 „	4/–



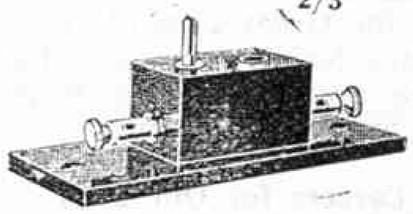
VALVE HOLDERS

Can be used also for carrying transformers, solid ebonite ... 1/3



SWINGING COIL HOLDER

Enables coil to be moved through an angle to give coupling effects 2/3

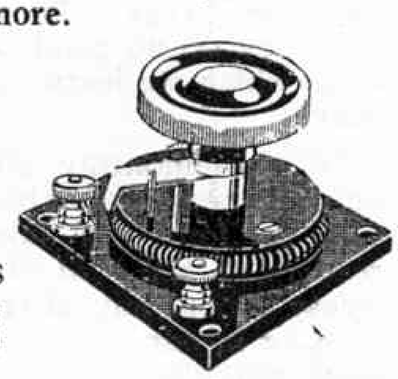


COIL HOLDER

Very economical method of carrying any type of coil ... 1/9

VALVE RESISTANCES

Made in solid ebonite for mounting on board 4/–



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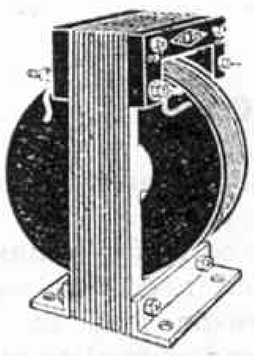

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The Men Who Gave Us Radio:

VII. LODGE, POPOFF, RIGHI, and MARCONI

This is the last of a series of articles giving an outline of the lives of the men who contributed to the invention of Radio as we know it to-day. Our articles have followed the progress of the wonderful science of Radio, dealing with the work of the various scientists who engaged themselves in the quest of a means of wireless transmission. This final instalment briefly outlines the work of Sir Oliver Lodge, Augusto Righi, and Senator Marconi. After reading these articles, Meccano boys will have a better realisation of the fact that the Radio of to-day is not the work of one man alone, but of many men, each of whom extended the field of research in turn.

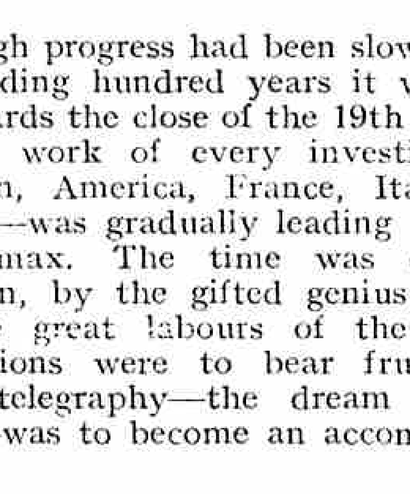
Lodge

IN 1894, Sir Oliver Lodge, lecturing in London, repeated Hertz's experiments. He demonstrated the efficiency of the new Branley "coherer" as a detector of Hertzian waves generated some 150 yards distant. It is remarkable to find that although wireless telegraphy was at this time well within Sir Oliver's grasp, it did not seem to occur to him that the coherer and Hertz's oscillator might be adapted to long distance telegraphy without wires. "Stupidly enough," he wrote later, "no attempt was then made to apply any but the feeblest power, so as to test how far the disturbance could really be detected."

Popoff

In 1895, Popoff, a Russian physicist, introduced the automatic "tapper." This was necessary to restore the metallic dust used in the coherer to its normal condition after the passage of an electric wave.

Although progress had been slow during the preceding hundred years it was evident towards the close of the 19th century that the work of every investigator—in Britain, America, France, Italy and Germany—was gradually leading up to a great climax. The time was drawing near when, by the gifted genius of one man, the great labours of the earlier investigations were to bear fruit, and wireless telegraphy—the dream of the century—was to become an accomplished fact.



Augusto Righi, celebrated Italian physicist, carried out many experiments in electricity and magnetism. He was born at Bologna on 27 August 1850, and died there on 8 June 1920.

Sir Oliver Joseph Lodge, born at Penkhull, Staffs., in June, 1851, was educated at University College, London. He was Professor of Physics at Liverpool University from 1871 until 1900, when he went to Birmingham as Principal of the University. He was knighted in 1902.

Righi

In the meantime Righi, a Professor at Bologna University, was investigating the Hertzian waves from an optical point of view. Righi was an enthusiastic disciple of Hertz, and he effected a considerable improvement in the latter's "exciter." He used two metal balls in place of knobs, and by placing them in an ebonite frame and filling the spark-gap with oil, he made its action more regular, and also improved the apparatus in other details.

One of Righi's pupils was a bright boy named Marconi, who was particularly interested in his tutor's experiments. There can be little doubt but that Righi's enthusiasm had a marked influence on young Marconi, causing him to turn his attention to applying the Hertzian waves to wireless telegraphy.

Marconi

Guglielmo Marconi experimented on a small scale in 1895 at his father's farm. His first trials proved successful, and he came to England during the following year. He obtained an introduction to Sir William Preece, who (as we have already seen) himself had carried out experiments in wireless telegraphy and telephony. Sir William, in his official capacity, greatly aided Marconi in the development of his invention.

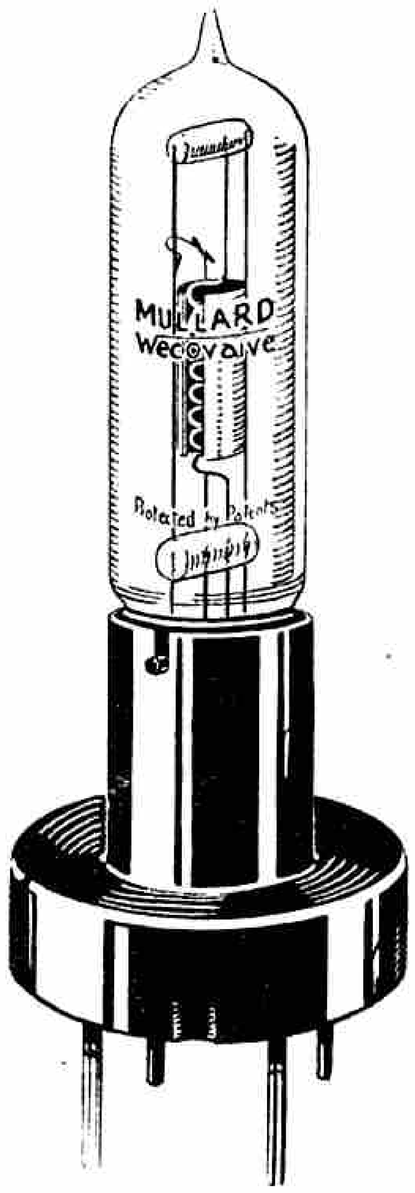
Marconi's system embodied the inventions of several previous workers. These inventions were improved in detail and so adapted that, collectively, they formed a practical working system. The "wave-exciter" of his original apparatus, consisting of brass balls or spheres separated by a short gap, closely resembled Righi's "three-spark exciter." The receiver consisted of a coherer similar to that used by Branley and Sir Oliver Lodge, but made much more sensitive by Marconi. The filings of this coherer were returned to their normal position, after cohesion by a "tapper," exactly similar in principle to that invented by Popoff, but again improved in detail.

In combining these individual inventions Marconi showed himself to be possessed of far-seeing initiative. He was sufficiently alert and practical to bring into operation an apparatus that worked, whereas other scientists—who might have forestalled him, but did not—were still endeavouring to "make sure." Righi himself had said that Marconi "carried into the domain of practical reality that which had only floated indistinctly before the minds of others or had served them for modest experiments."

Great credit is due to Marconi for achieving a victory over innumerable practical difficulties. His success depended entirely on what were apparently but trivial matters of minor importance. It was only by unremitting study, perseverance and attention to detail, however, that the imperfections were finally eliminated, enabling the completed scheme as a whole to become a success.

THE END

Guglielmo Marconi, born at Bologna (Italy), 23rd September, 1875, and educated at Leghorn, evolved the first practical system of wireless telegraphy. He communicated across the English Channel in 1899, and two years later he succeeded in communicating across the Atlantic.



Mullard Wecovalves.

The Mullard Wecovalve, fitted with a standard 4-pin base, is the last word in Wireless Valves. It takes but a single dry cell to operate the filament, and a cell of normal size will last for months.

The cost of the valve is 30/- and its life is therefore of great importance compared with that of inexpensive dry cells.

In normal use, the Mullard Wecovalve filament will last for 4,000 hours, whilst mechanically it is unbreakable.

It is short and robust in construction and has in no way been attenuated in order to reduce current consumption.

The life of the valve is no longer than that of its filament.

Turn these points over and then order Mullard Wecovalves for your set.

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(E.P.S. 85)

Boys!

Learn

How to make *real* things

Every boy should get his parents to buy him this book

In the evenings and over the week-ends a boy can soon become proficient in a number of trades with the aid of this wonderful book. The directions are easy to follow and the illustrations show clearly every stage of the job you want to do. Hundreds of hobbies that will delight every boy are also included.

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Shows you how to do over 400 useful jobs

Here are a few of the four hundred jobs you can learn to do :—How to install your own wireless set—To overhaul a motor-cycle, bicycle, motor car, etc.—To build a summer-house—How to mend windows—To paint and paper a room—To make boots and shoes—Simple bricklaying—Upholstering—To repair a hot-water cylinder—Glazing greenhouse windows—All about metal turners' lathes and other tools—Fitting stair carpets—To make a hot-water towel rail—All about the gramophone—To install a speaking-tube—Piano repairs—To make an ottoman chair from an old cask—How to join two pieces of iron—To repair plaster—To make a barometer—To make a rack for brooms—All kinds of rustic furniture for the garden—A brickwork pedestal for a sundial—Varnishing and staining—Scene painting for theatricals—To make an overdoor shelf—To mount maps, etc., etc.

This would make an Ideal Christmas Gift for boys of 15 years or over

What Parents say :

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W. Glincey, London, N. "I think the *Amateur Mechanic* is a splendid book. In my opinion it should be in every home where boys are growing up."

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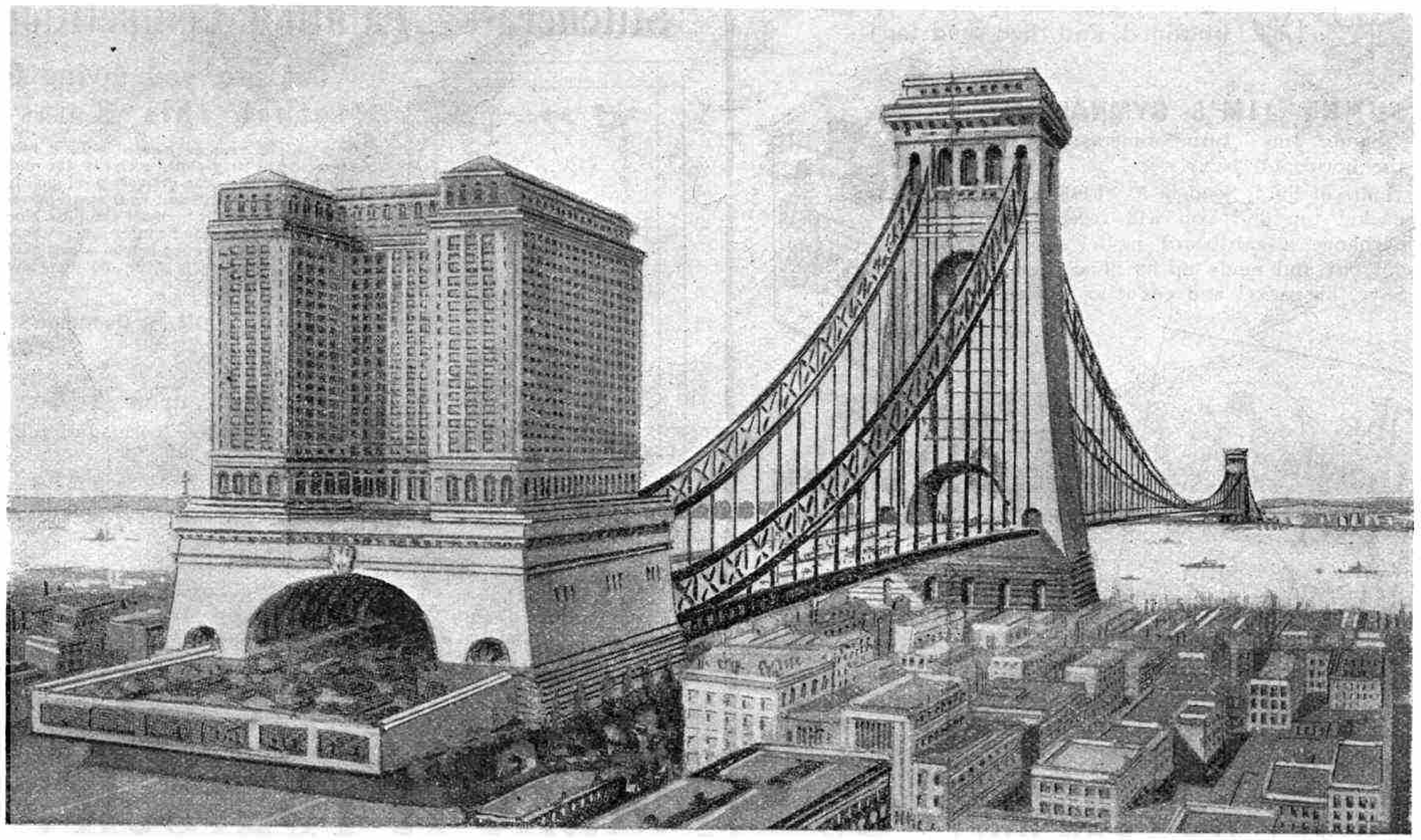
Famous Bridges II.

A Monster Bridge:

Two Tramways, Two Railways and a Road Wider than Kingsway



The above drawing, which is reproduced by the courtesy of the "*Architect's Journal*" and "*Everyday Science*," gives a vivid representation of the completed appearance of the proposed new bridge at New York

ALTHOUGH the business section of the city of New York is located on the island of Manhattan, nearly everyone lives on the mainland, where the suburbs are situated. These residential districts are separated from the city by the East River and the Hudson River, the latter being almost a mile in width.

First Bridge at New York

It is not so very long since there were no bridges at New York, and city workers had to cross the East River and the Hudson River, morning and evening, by ferry steamers. As the numbers of workers in New York continued to increase, however, the accommodation provided by these ferry steamers became very much overcrowded. It was in the desire to ease the situation, created by the changed conditions, that the first suspension bridge across the East River was built. This bridge was rapidly followed by other bridges, until at length the great American city became famous for having more large bridges than any other city in the world.

In the meantime every year has brought more workers and more traffic. Now, even the present numerous bridges already existing are not sufficient to accommodate the increasing flow of pedestrians and vehicles from one shore to the other.

Largest Bridge in the World

Plans are therefore being made for the building of a new bridge, and this, although not the longest, will certainly be the largest bridge in the world. It may possibly be the last massive iron bridge to be built, for the cost of such heavy metal structures is now rapidly becoming prohibitive.

According to the present arrangements the bridge will be 6,600 ft. in length. It will be divided into two shore spans, each 1,710 ft. in length, and a central span of 3,240 ft. The distance between the anchorage on Manhattan Island and the anchorage on the mainland will be 7,460 ft.

Bridge Road Wider than Kingsway

The new bridge will not only accommodate vehicles and pedestrians, but will also carry trams and trains. It will have two decks, each 220 ft. in width. The upper deck will be divided into two roadways, one for motors and the other for vehicles. This roadway will be 155 ft. in width, and our London readers will be able to realise what this will look like when it is mentioned that it will be wider than Kingsway.

On each side of this roadway will be a tramway track, beyond which will be two footpaths 17 ft. in breadth. Access to the upper deck of the bridge will be gained by a central lofty arch, with two smaller side arches to admit the traffic to the bridge approach. The lower deck of the bridge will be used only by trains, and it will carry ten lines of railway track.

The bridge will be of the suspension type, the two decks being suspended from four steel cables, two on either side. These cables will consist of 80 lines of eye-bars, arranged in three banks and enclosed in tubular bronze casings 15 ft. in diameter.

Massive Towers

In order to obtain sufficient height to give the suspension cables the requisite curvature, it will be necessary for the suspending towers to be 840 ft. in height. Each tower will measure 400 ft. in breadth at the ground level, tapering to 200 ft.

(*Continued on page* 211)

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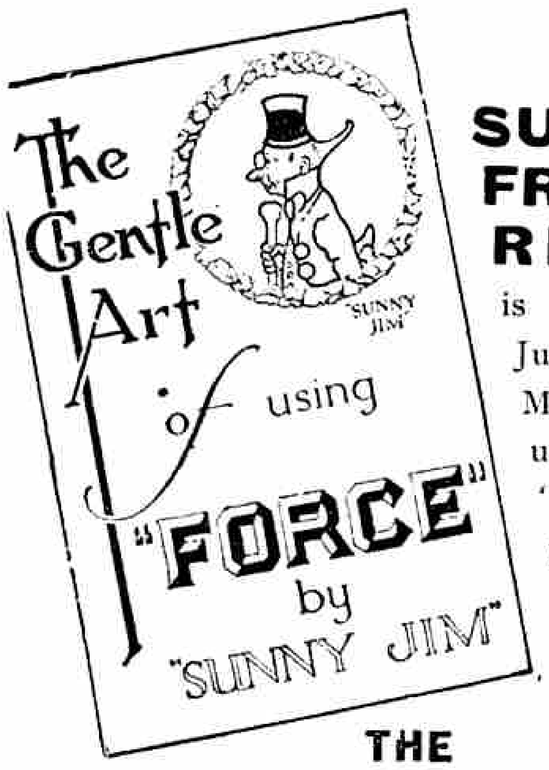
Choose whatever you like from this list, read carefully how it can be obtained, and then send for it.

SUNNY JIM'S GYMNASIUM

"Sunny Jim" turns somersaults on the horizontal bar.

Hours of fun! Send in a "FORCE" packet top and you will receive in exchange a cardboard model to be cut out and made up as illustration. Save the packet and cut it as shewn.



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"FORCE" is delicious toated malted wheat flakes, the **whole** of the **wheat,** served in an instant by adding hot milk.

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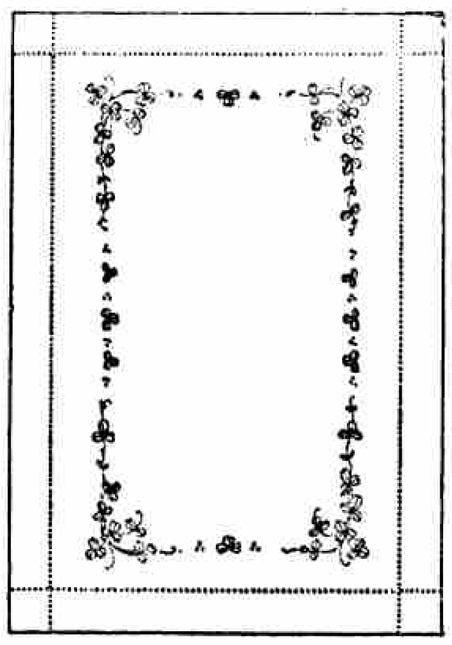

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A Talk About Aerials

BY THE RADIO EDITOR

This is the second instalment of a series of articles describing the best types of aerials to erect, according to local circumstances. In the last number of the "M.M." we described a simple aerial from a pole in the garden to the house, and from a tree to the house. On this page we deal with two types of aerials that are most often used, the "inverted-L" and the "T."

IV.

ONE of two types of aerial is usually employed by amateurs. One known as the inverted L-type (Fig. 5) and the other the T-type (Fig. 6). These aerials are so called because of their resemblance to the letters L ("upside-down") and T.

It has been found that the "orientation," or the direction of the compass in which an aerial runs, affects the strength of reception. To obtain the maximum strength the end of the aerial should be "end-on" to the transmitting station from which signals are being received.

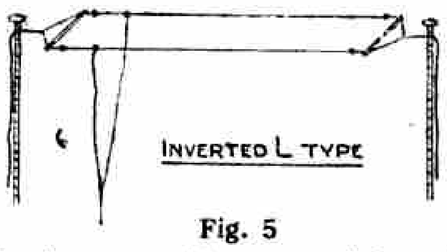


Fig. 5

That is to say, if an aerial points due north and south it will be most efficient in receiving from transmitting stations in the north and in the south, rather than from stations in the east and west. Such an aerial is called "directive," because it is most sensitive to signals from a particular direction.

Greater signal-strength is obtained by taking the lead-in wire from the end of the aerial that is nearest to the transmitting station. Thus, if you are due north of London, and wish to receive broadcast at the greatest possible strength from London, your aerial should be oriented north and south and your lead-in wire taken from the south end of the aerial. In this case, therefore, the aerial used will be of the inverted L-type (Fig. 7).

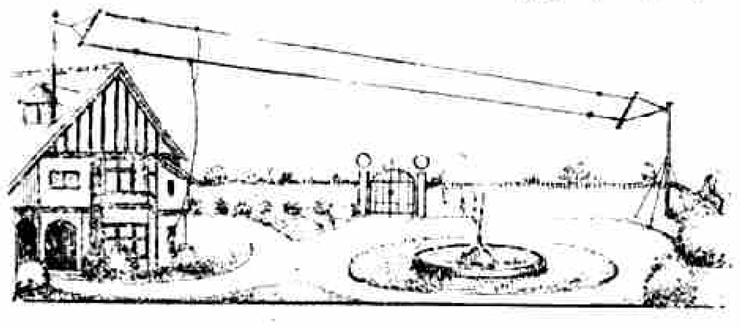


Fig. 7

Should you be situated midway between two broadcasting stations, and wish to receive signals of equal strength from each, the lead-in wire should be taken from the centre of the aerial. Such an aerial will be of the T-type (Fig. 8).

We thus see that the aerial is firstly governed by the circumstances in which you are situated—long garden, flag-pole, or house chimneys. Secondly, where the greatest efficiency is desired, the aerial is governed by the orientation, depending on the direction of the broadcasting station from which it is desired to receive the loudest signals.

V.

The fact that an aerial is directed towards one particular broadcasting station does not mean that signals will not be received from other stations. Much depends on the local surroundings, but it may be said that, as a general rule, a directive aerial will enable signals that would otherwise only be faintly heard, to be heard clearly or even loudly. At the same time,

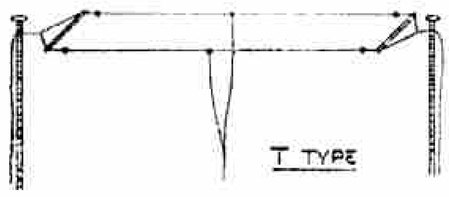


Fig. 6

the orientation of the aerial for this purpose may have no detrimental effect at all upon the loudness of signals from another broadcasting station that is situated at a shorter distance.

The following example will, perhaps, help to make clear my meaning. I have an inverted L aerial, of 60 ft. in length and 20 ft. in height, and situated at Liverpool. It points directly towards the Glasgow station and the lead-in wires are taken from the north end. Thus, everything is in favour of receiving good signals from Glasgow, and these signals do, in fact, come in very loudly (on a four-valve set). At the same time, I get almost equally loud signals from London, although my lead-in is at the wrong end for the *greatest* efficiency from London.

By altering my aerial to a T-aerial I get signals a shade louder from London, but less loud from Glasgow. But with either the L or the T-type, signals from Manchester (25 miles distant) are equal in volume, although in each case my aerial is "broadside-on" to Manchester. By altering the orientation of the aerial so that it points directly to Manchester, with the lead-in wires nearest to Manchester I get Manchester a little more loudly, but both London and Glasgow are very much fainter.

Thus, in my case it is best to have an inverted L-type aerial oriented on Glasgow, because I get both Glasgow and London satisfactorily with this type. It is better to have my lead-in wires from the north end, because I can afford to lose a little of the volume from London in order to gain more from Glasgow, which seems to transmit with slightly less power than London.

VI.

So far we have dealt with aerials of the standard types generally necessary with a crystal set, at distances over about 15 miles from a broadcasting station. It is not every boy who can erect such an aerial as these, however, and those who find none of the above aerials possible, and who live not more than 15 miles from a broadcasting station, may employ a more simple form of aerial. They are advised to experiment with an aerial

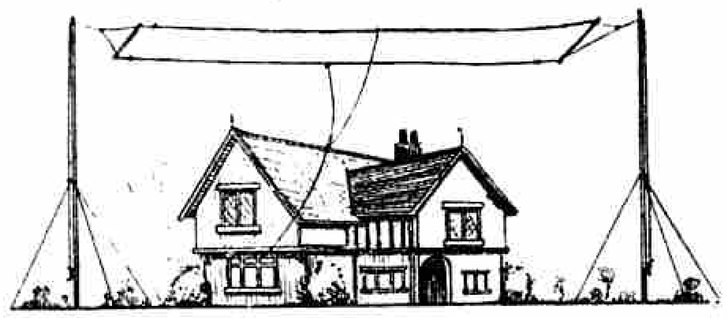
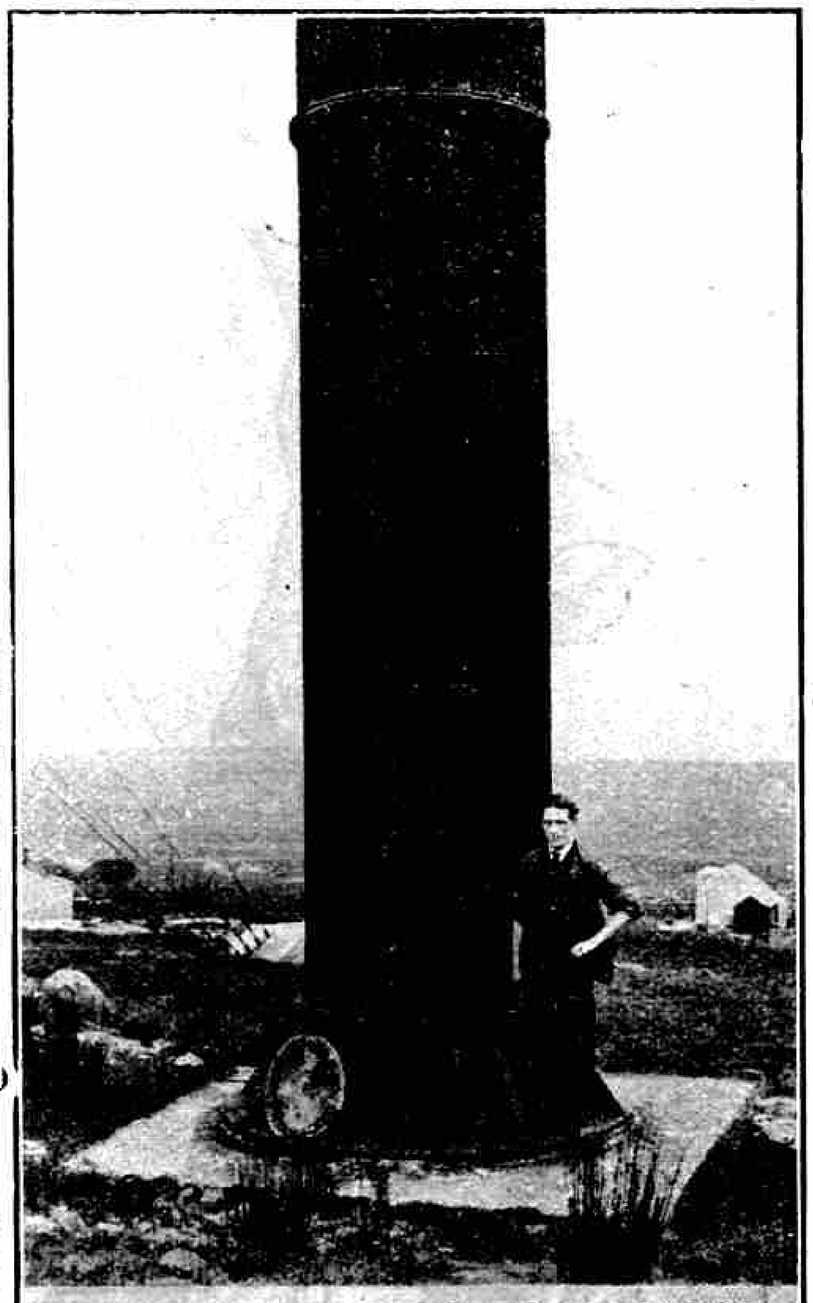


Fig. 8

suspended between two chimney stacks—either on their own house or from their house to that of a neighbour. If the full length of 100 ft. (less the height) cannot be obtained for a single wire, a shorter wire may be used, or, as an alternative a double antennæ wire may be erected. This consists of two lengths of wire, say 30 ft. each, or whatever other length is convenient. Each length is separated by a spreader formed by a light piece of wood or bamboo not less than 5 or 6 ft. in length. A treble antennæ may be employed if desired, although, except in special circumstances, it will probably be found that three wires are little better than two wires.

(To be continued



CARNARVON— MAST, FIRST SECTION.

"Some" Mast

Our illustration, published by the courtesy of the Marconi Company, shows the base of one of the huge aerial masts at the Radio Station at Carnarvon. The tubular steel masts rise to a height of 400 ft. These are arranged in four rows, and form a very impressive feature of the landscape. The aerial used is of the inverted-L type.

This high-power station is used for direct transmission to Australia, a distance of over 12,000 miles. Messages are transmitted on wave-lengths of from 14,000 to 30,000 metres.

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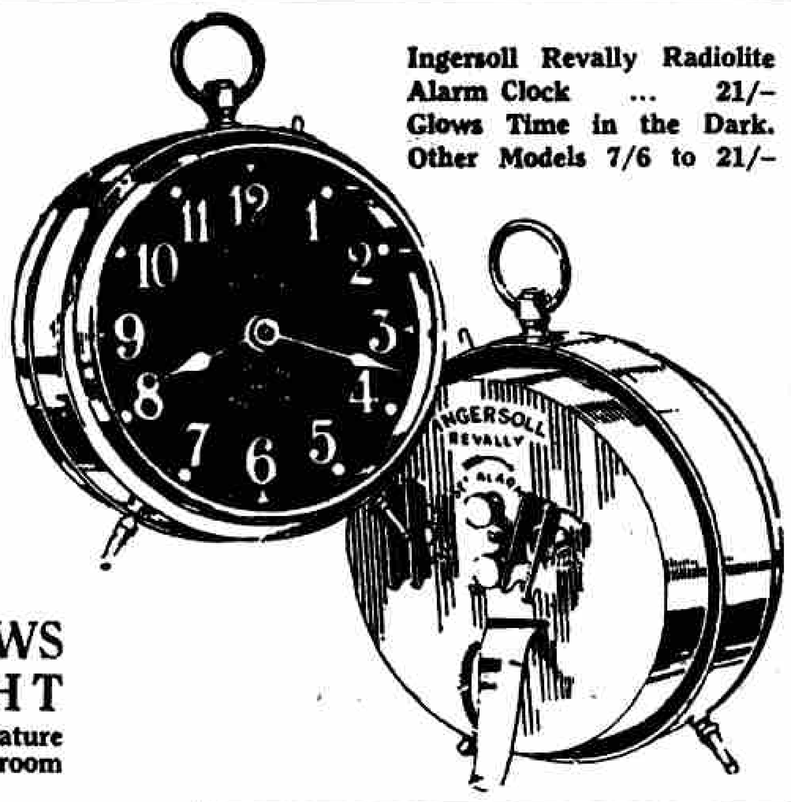

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A Message from The Rt. Hon. G. H. Barnes, P.C.

MECCANO is not only a toy for boys but it affords food for reflection on the part of grown men. I myself derive a good deal of pleasure from Meccano in watching my grandson building bridges and cranes and other models. He does not copy all these from the book of Instructions, but invents many new models himself. We keep a Meccano Outfit for him here and they are duly dragged out on his frequent advent among us. Our Dick is a firm believer in ocular demonstration, and always occupies a good deal of floor space!

Rt. Hon. G. H. Barnes, P.C.

Meccano is unquestionably the greatest thing for boys, and it will have its effect upon the youngsters as they grow into men. It is a true saying that "the boy is father to the man," for as the mind of the boy is moulded, so will that of the man be set. And, at least as regards mechanics, the moulding is helped by Meccano better than by mere oral teaching or flat board demonstration. I speak as one with some knowledge, because I spent a good deal of my early life in plying the rule and compass.

I am sure that Meccano is giving boys a taste for construction which could not be otherwise given. It prepares the ground for education in building or machine construction. It gives an insight into the interdependence of parts, which apprentices are denied because they are often kept for long spells on one part of a design without any opportunity of finding out its relation to other parts in the scheme of things.

This knowledge is essential if we are to maintain our position in the world of work. Our workmen are the best in the world when given a job to do, but the world is ever changing and they must be alert to change with it. New ways of doing things are always being brought out, as the result of knowledge of mechanism that the mere use of tools cannot give. This is where we are being "caught out" by France and America in some forms of specialised industries in which Britain was at one time supreme. What is needed now, is a quickened intelligence and a renewed interest in work for work's sake and both these requirements are stimulated by Meccano.

But there is another and a more immediate quality possessed by Meccano. It is distinctly British. It is produced by British labour and produced in such quantity as to have become quite a British industry. This should appeal to those who, like myself, are concerned about British unemployment. The sale of Meccano in place of foreign productions provides and perhaps increases employment for British labour.

Meccano has more than held its own in quality, in suggestiveness and attractiveness, as compared with the best of similar productions from abroad. I regard this feature with special satisfaction, because I am old enough to remember the displacement of some of our high class productions by American competitors. We cannot afford to lose industries because we cannot afford to lose employment. There never was a time when it was so important to retain our industries and, indeed, to add to them. Meccano is an industry we should stick to, encourage, and add to.

For these and other reasons I commend Meccano and wish it the best of good luck among the boys and those who cater for the boys. Those who would combine the genial atmosphere of Father Christmas with a useful stimulant to both youthful ingenuity and British industries cannot do better at the coming festive season than place a Meccano Outfit in the hands of British boys.

G. H. BARNES.

A Message from The British Broadcasting Co.

THE readers of the *Meccano Magazine* live in a happy age. There are few greater pleasures than that of constructing things for ourselves. Young and old alike seem to find a good deal of enjoyment in the construction of home-made wireless sets, and in the use of them afterwards.

It has sometimes struck me that the boys of the present day know so much, that they may lose the sense of wonder. This would be a great loss, and one which, I hope, they may never experience. I know one of our greatest scientists who never uses a telephone without feeling what a marvellous thing it is. Although I spend all my days thinking about Broadcasting, it still seems to me a marvellous thing that a person may speak from our studios in London, or from any of our stations throughout the country, and be heard by over a million people, from Land's End to John o' Groats. Every day and every evening, there is speech and music in your home. All that is necessary to hear it is an aerial and a receiving apparatus, which many of you will no doubt be making for yourselves, or buying complete.

The British Broadcasting Company has all along been anxious to cater for those who wish to make their own wireless sets, and at last a licence has been provided for this purpose. I do not like to intrude upon the columns of a Christmas number by talking about pains and penalties, but I expect you know that nobody may use a wireless receiving set without a licence. Without a licence they are disobeying the law, and such a course is not wise. Apart from this, they are avoiding payment towards the heavy costs of maintaining the broadcasting service.

Another point I wish to make clear to you is that the Constructors' Licence is issued to those who will use only British parts. When you go to your dealer to ask for parts, it would be better to say to him "Are you sure that these are British parts?"

There are a great many people out of employment just now, but we are already finding work for many of them in the wireless industry. If everybody who constructs a set will loyally observe the condition of the licence (that only British parts are used) there will be a great deal more employment for British labour. I am sure that you will realise this and will do your best to help. The pleasure of constructing your own set will be all the greater if you know you have helped to keep in employment someone belonging to your country.

There are a number of items already included in our programmes that are of special interest to readers of the "*M.M.*" If there are items not at present provided, which a number of you would like, perhaps you will let your editor know. If he will pass the suggestions on to us we will see what we can do about it. Your interest in wireless should not end when your set is complete, for we wish you to realise that when you have a really good British set, you are in touch with one of the greatest services that the world has ever known.

J. C. W. REITH,
General Manager B.B.C.

Note. I shall be very pleased to hear from readers of the "M.M.", with suggestions or new items to be broadcast. Write neatly on a postcard and address to "Broadcasting," Meccano Magazine Liverpool.—EDITOR.

Birthday Gifts for Meccano Users

When is your birthday?

In every Meccano Outfit or Hornby Train Set purchased this Christmas there will be found a special entry form on which full particulars of Mr. Hornby's birthday scheme are set out. A handsome pocket wallet will be presented to those boys whose birthday falls on the same day as Mr. Hornby's. This wallet is strong and durable, of excellent quality, and should wear for many years. All that is necessary to qualify for this gift is that the purchaser of a Meccano Set or Hornby Train should fill in the form and post it to Meccano Limited. The date of Mr. Hornby's birthday will be announced in the *Meccano Magazine* for May next.

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OUR BUSY INVENTORS

RECENT INTERESTING PATENTS

Every day new inventions and ingenious labour-saving devices are being brought into existence. From time to time the more interesting of these will be described and illustrated in these columns. The Editor of the "*M.M.*" will be pleased to hear your opinion of this new feature. Readers are invited to send us particulars (accompanied, if possible, with photos, sketches or cuttings) of any interesting inventions or devices that may come to their notice.

IT has sometimes been said that there is nothing new under the sun. If our readers could see the flood of inventions that is daily being poured into the Patent Office at Somerset House, however, they would feel justified in casting some doubt on the statement. Not only are hundreds of new ideas—some good, but many "no good"—received, indexed and filed every week at Somerset House alone, but the same remarks apply to every patent office in the world. During the war, of course, there was a distinct lull in all patent offices, except for inventions relating to devices for the prosecution of the war. An examination of the current patent offices records, however, abundantly proves that the world's inventors are getting well into their stride again!

The study of inventions and patents is very fascinating. It shows that there is always something new to puzzle our brains over, or some new method of doing things that appeals to our imagination. It must be especially fascinating to Meccano boys, who are born inventors—as anyone may see when watching their ingenuity and originality in making their models. What a pity it is that so many lose this habit of invention when they grow older. It is a most valuable and stimulating gift that should be developed and encouraged wherever possible.

It is most interesting to watch the stream of inventions as they flow through the patent office, and to endeavour to pick out those that are likely to prove successful and profitable. Nine-tenths of them are probably never heard of again, and of the remaining tenth, very few will ultimately prove of lasting value to mankind.

Wonderful Discovery of an Engineer

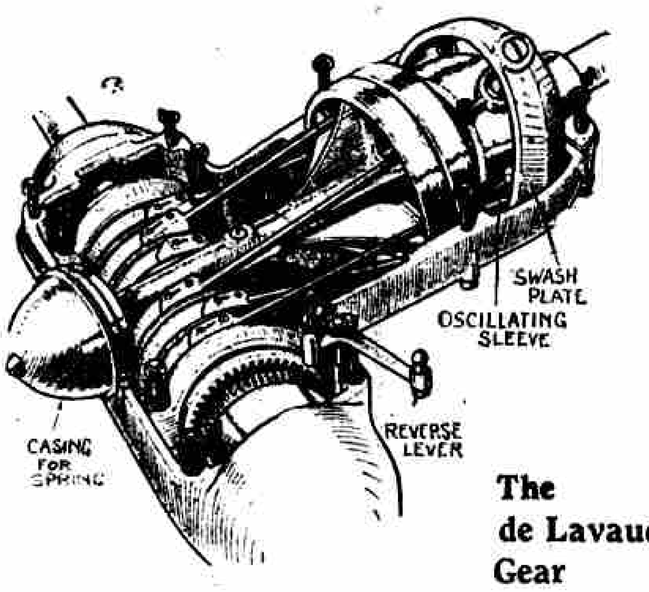
During the last few months some startling discoveries have been made by engineers investigating the possibilities of new forms of transmission. One in particular has recently created world-wide interest and promises to revolutionise motor transport as known at the present time. This is the "Torque" Converter, invented by Mr. George Constantinesco. As a result of this invention it is possible to have motor cars without clutches or gears. One result of this will be that motor cars of the future will run as silently as a falling leaf! Hills will be climbed without loss of speed, and there will be much less wear and tear because the engine will always be running at the correct speed for its particular load and gradient.

Interview with Inventor

Immediately the new discovery was announced we wrote to the inventor, Mr. Constantinesco, and told him that Meccano boys would be delighted to hear full details of this marvellous mechanism. For this purpose we placed the columns of the "*M.M.*" at his disposal. "Come and see me," said the busy inventor, in reply. Our readers may be sure that we lost no time in responding to this kind invitation and a representative of the "*M.M.*" waited upon Mr. Constantinesco at the earliest opportunity. A full account of the interview will appear in our next issue and I can promise our readers that they will be intensely interested in it. Mr. Constantinesco is the inventor of many amazing devices, not the least important of which is a death-dealing trench mortar and the device that enables a machine gun to fire through the revolving propeller of an aeroplane.

A New French Gear

Another and somewhat similar invention is also announced by a French engineer, M. de Lavaud. This is known as the de Lavaud gear, which, when fitted in the rear axle of a car, takes the place of three portions of the ordinary chassis. It does



The de Lavaud Gear

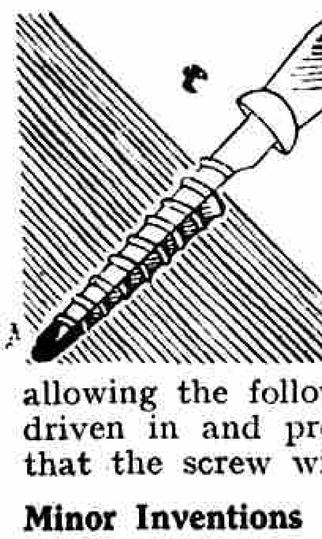
the work of the gear box, differential and the back-axle drive, only the clutch being retained. The gear box and differential are replaced by an infinitely variable range of gears. This device automatically adjusts its gear ratio to the gradient on which the car is travelling, the ratio being increased on the level and lowered on a gradient, without any attention whatever from the driver.

Our Busy Inventors—(*cont.*)

We hope to have more to say on this subject in one of our future issues.

A Non-slip Nut

Nuts often come adrift from their bolts and sometimes this leads to disastrous results. To prevent such accidents a nut has been designed that locks itself on to its bolt. The nut is slotted, as shown in the accompanying illustration, and the two halves exert a pull on each other, binding themselves securely to the threads. The new nut does not require a washer and also effects an economy in material, for shorter bolts may be used. It is to be manufactured in many different sizes and will be specially useful in automobiles and machinery construction, as it is not affected in any way by excessive vibration.



For Carpenters and Handymen

Wood often cracks when screws are being driven into it, even though a hole is drilled for the screw. To overcome the difficulty a new type of screw has been invented. As may be seen from the illustration the screw has been ground down to cut a good thread, allowing the following screw to be easily driven in and providing a good grip so that the screw will not pull out.

Minor Inventions

Among numerous other small inventions that are worthy of note, this month, we notice the following :—

An automatic music-sheet turner for all sizes of pages. The sheets are engaged by clips of fine wire and turned when pressure is applied by the player to a foot pedal.

* * * *

A clock that will prove useful to those Meccano boys who find themselves unable to save money. This clock requires winding every 24 hours, but it cannot be wound until a coin is put in the slot to release the spring. This invention comes from America, where it has been introduced to encourage thrift.

* * * *

A new self-feeding tack-hammer should save many a bruised finger. An endless fabric belt to which 70 tacks are glued, runs inside the handle from the butt of the hammer to the head. The tacks are projected one at a time, point outward, at the butt end of the handle. The user, striking the butt on the spot where he wishes to drive the tack, starts the tack in the wood. Loosening it from the belt, it is driven home in the usual way.

* * * *

To the dozens of existing devices for sharpening pencils another has been added. This one comes from San Francisco, and commences to sharpen a pencil the moment it is inserted. Either a fine or a chisel point (such as draughtsmen prefer) may be given to the pencil as required. To make the invention quite complete, an emery cloth puts a fine finish to the lead, whilst automatic cutters clear away the wood !

How to Obtain the "*M.M.*"

The "*Meccano Magazine*" may be ordered from your Meccano dealer, or from any newsagent or bookseller, price 2d. If you are not able to obtain the "*M.M.*" from these sources it may be obtained direct from this office, post free, six issues 1/6, 12 issues 3/–.

The next number of the "*M.M.*" will be ready on 10th January. As we print only sufficient copies to supply orders received, you should place a regular order with your dealer or newsagent, or direct with this office, to avoid disappointment.

"*Meccano Magazine*"
Binns Road, Liverpool.

BRIGHT IDEAS

These columns are reserved for dealing with suggestions sent in by Meccano users for new parts, new models and new ways of making Meccano model-building attractive. We are always pleased to hear from any Meccano boy who has an idea which he considers will be useful in the Meccano system.

H. Oddie (Carranballac, Victoria).—(1) Regret, but we are not able to follow your suggestion for a cup with a boss and cone plate. (2) Circular sections are having our attention.

Stanley and Philip Love (Bristol).—We shall go into the matter of the method of securing the signal to the track. We intend to introduce more elaborate railway signals in the near future.

C. J. Salt (Lincoln).—(1) Triangular corner plates have already been brought to our notice and we consider they might prove quite useful. (2) The ½" pinion in mesh with the 50-toothed gear wheel gives a ratio of 2 to 1, and the ½" pinion, meshed with a 1½" wheel, gives a ratio of 2¾ to 1. Do you consider the ratio suggested between these two would have any practical application? (3) The question of circular plates is already exercising our attention.

Bernard J. Hobden (Battle).—(1) We are considering the advisability of introducing three lengths of perforated holes on the face of the sector plate. (2) If the mechanical parts of a model are properly adjusted to give free and easy action, the roughing of the groove in the pulley wheels to give extra grip should not be necessary.

John Candler (Tulse Hill).—Further information regarding your suggested new part would be helpful, as we cannot quite place it from your sketch.

H. Bradby (Reigate).—(1) Large-size reversed angle strips are of doubtful value, but we shall go carefully into the matter. (2) The necessity for large wheels has not yet presented itself, but we shall keep the matter in mind. (3) Helical or twisted gears are already under consideration.

G. Corby (Cheadle).—(1) See our reply above to H. Bradby re large wheels. (2) Can you give any instances where hollow shafts are used? (3) The introduction of a groove in our rod to give a sliding action is not practical on account of the smallness of the diameter.

Frank Ellis (Bradford).—(1) In making suggestions for new parts it helps us considerably if an instance of their application is cited. What do you consider are the uses for a complete circular strip? (2) We shall keep in mind your second suggestion for a circular plate.

Ralph Brown (West Bromwich).—(1 and 2) The instances where strips or rods longer than 12½" are used are so infrequent that they are not justified. A comparison between long strips and long girders cannot be made. Consecutive numerical tabulation of the accessory parts would not be practicable. The system of subsidiary lettering enables new additions, which are constantly being made, to be kept under the main heading number.

N. Herald (Manchester).—A flexible rod would be costly to manufacture and we cannot see that it could have any real practical use.

OUR MAIL BAG

In this column the Editor replies to letters from his readers, from whom he is always pleased to hear. He receives hundreds of letters each day, but only those that deal with matters of general interest can be dealt with here.

Correspondents will help the Editor if they will write neatly in ink and on one side of the paper only.

Oscar Newman (Tongoa, New Hebrides).—It will be remembered that in our February issue we printed a letter received from Oscar Newman in which he told us that he was the only white boy on the island in the New Hebrides, where he lived. Oscar now writes us again to say that since we published his letter he has received friendly letters from hundreds o :Meccano boys and he asks us to thank them most sincerely for their kindness. He will try to reply to them all, and he hopes to keep up a regular correspondence with a few boys in Great Britain. Loneliness is a terrible thing, and it was fine that these hundreds of Meccano boys should spontaneously desire to let Oscar know that he is one of us, even though he is so far away and we shall probably never see him.

W. Summarsell (Brighton).—In a very short time now we shall commence to illustrate new models of a simple type, for those who do not own big Outfits. We quite appreciate your arguments, and shall certainly not confine ourselves to big models, however attractive they may be.

W. Clarke (Hyde).—We like your letters and we like the spirit in which you enter our competitions. Nothing would please us better than to see you win one of the beautiful championship cups which are to be offered in the next Model Building Contest. A boy, who, like yourself, has had Meccano for his hobby for ten years, has always a warm corner in our hearts.

W. F. Coates (Streatham Hill).—

There was a young lady of Harwich,
Who once wrote an essay on marwich,
She said " All you do
Is to swear to be true
And then you drive home in a carwich."

This is the only one of your limericks for which we can find space. If we start a puzzle and rhyming column a little later, as we may, your undoubted talent in this direction should make you a useful contributor.

E. G. Powell (Burton-on-Trent).—" Why is a horse with its head hanging down like the "*M.M.*" on the 8th of the month? *Answer:* Because its neck's weak." If we get much more of this we shall certainly have to start a riddle column.

E. Draper (Southampton).—Without the advertisements we should probably not be able to put the "*M.M.*" into these beautiful coloured covers which we are now using. They also enable us to enlarge the "*M.M.*" and give more articles on engineering and other interesting subjects. Watch the "*M.M.*" grow, Edward.

G. Kay (Pinner).—No ! that is not really us at the top of our Editorial column. Our brow is a little more wrinkled than that, but it unwrinkles beautifully when we receive such nice friendly letters as your's, and then we are not really bad looking at all.

H. Piggott (C.-on-M., Manchester).—" How about enlarging the '*M.M.*' and charging 2d. for it. I know boys who pay 4d. for a blood, and the cheapest is 2d. now-a-days. The '*M.M.*' is the finest in the world." We intend to keep the price as low as possible, but we shall most certainly continue to improve it, Harry.

R. Peet (Nottingham).—Most boys commence a diary at some time, but very few get beyond the first few days. You might try it, Ronald, and let us hear from you about a month after you have commenced it.

E. Bonnici (Sliema, Malta).—Many thousands of our readers at home listen-in to splendid concerts every night, and we are sorry that you are deprived of this pleasure. You must induce your father to transmit a little music from his own set for the benefit of the boys in Malta. We are mailing you full particulars of the Correspondence Club.

G. Irlam (Salford).—Our articles on Railways have always been popular, and we shall commence a new series very shortly. We have so much to print, and our space is very limited, that these must wait their turn.

D. Ayes (Darjeeling, India).—Thanks for your endeavours to make Meccano better known in India. Your photos are interesting and we shall be glad to see more. You have our best wishes for your success in the A.M.I.M.E. Exam.

V. G. Govett (London).—Thanks for your suggestion that we issue Guild brooches and pendants for those who prefer them to the regular Guild Badges. This has been suggested several times, and we should like to have the views of other readers.

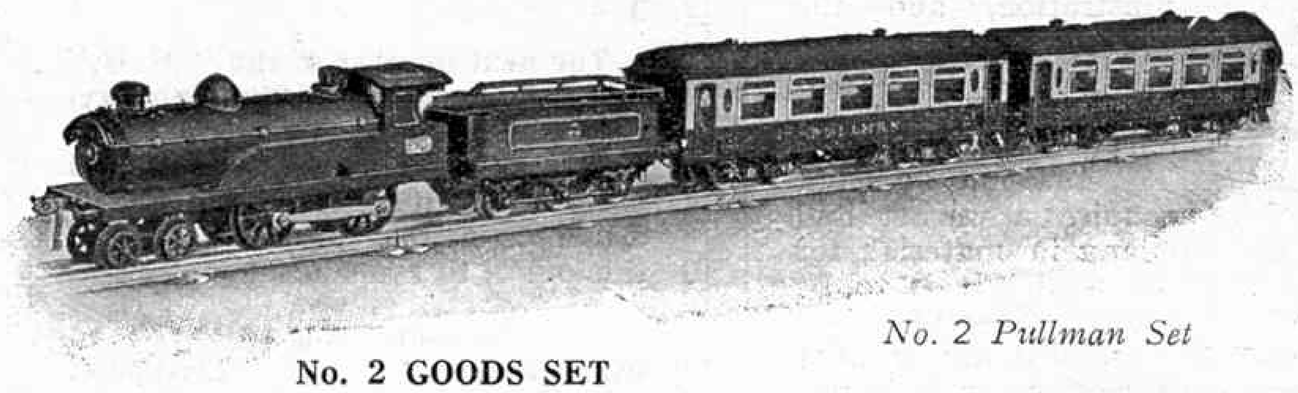
HORNBY CLOCK WORK TRAINS

THE TRAINS WITH THE GUARANTEE

A most valuable and remarkable feature of the Hornby Trains is that they may be taken to pieces and rebuilt, just like Meccano models. All the parts are standardised, and any lost or damaged sections may be replaced with new ones.

No. 2 PULLMAN SET

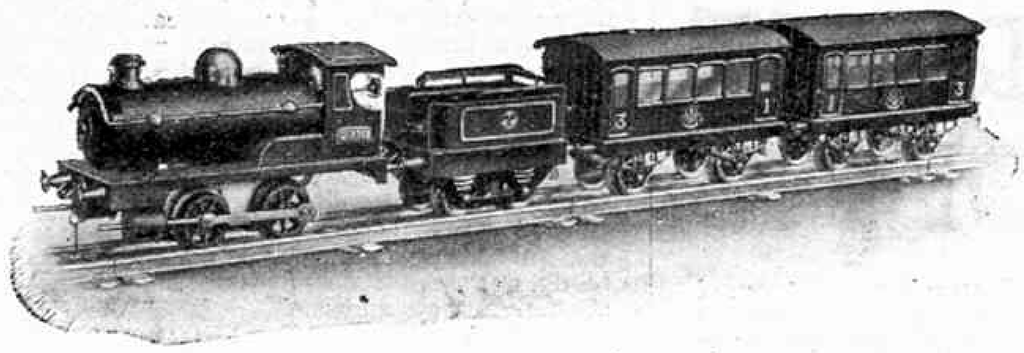
The No. 2 Pullman Set is a beautiful production. The Loco and Tender measures 17″ in length. It is built of standardised parts, enamelled in colours and beautifully finished. Fitted with reversing gear, brake and governor. Complete set in brown leather-finished gold-embossed box 70/–



No. 2 Pullman Set

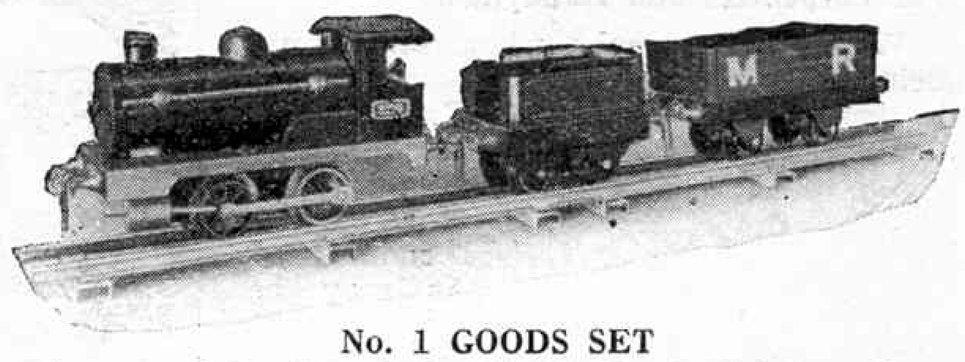
No. 2 GOODS SET

This Set contains Loco, Tender and Rails (as in the No. 2 Pullman Set), and two Goods Wagons. Superbly finished. Gauge 0, in colours to represent L.M.S. and L. & N.E.R. Co.'s rolling stock. Complete set in brown leather-finished gold-embossed box 45/–



No. 1 PASSENGER SET

This set contains Loco, Tender, two Passenger Coaches and Rails. Gauge 0, in colours to represent the principal British Railway Companies' rolling stock.
Complete in brown leather-finished, gold-embossed box, price 35/–



No. 1 GOODS SET

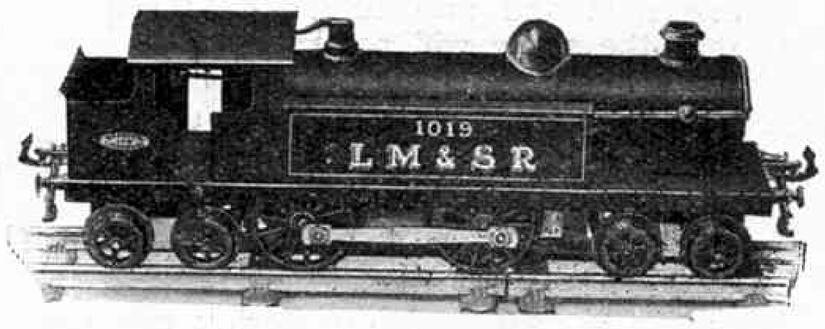
The Loco and Tender of the No. 1 Goods Set are the same as No. 1 Passenger Set. A Goods Wagon is supplied in place of the Passenger Coaches. Each Loco is fitted with reversing gear, brake and governor. Gauge 0. Complete in brown leather-finished gold-embossed box, price 25/6

Guarantee

Hornby and Zulu Trains are tested and their efficiency is guaranteed. A form of guarantee is furnished with each Loco. We undertake to repair or replace, at our option, any Loco that fails to run satisfactorily from any cause other than mis-use, within 60 days of date of purchase.

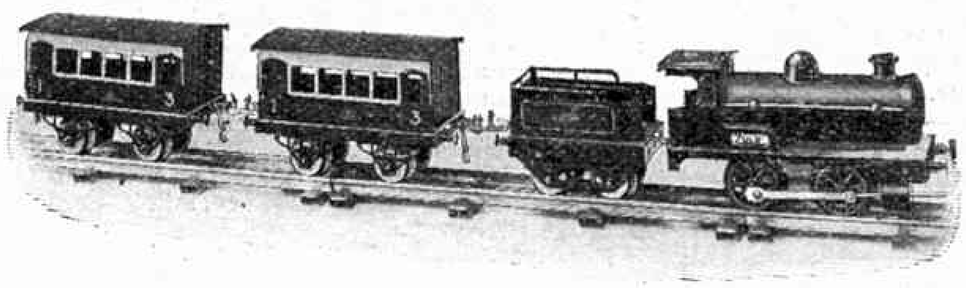
HORNBY TANK LOCO

The Hornby Tank Loco is a powerful model, embodying all the characteristics of the Hornby Train. It is 11½″ in length and is fitted at both ends with a special bogey. Beautifully enamelled and finished, Lettered L.M.S. and L. & N.E.R. Fitted with reversing gear, brake and governor. Gauge 0. Price 32/6

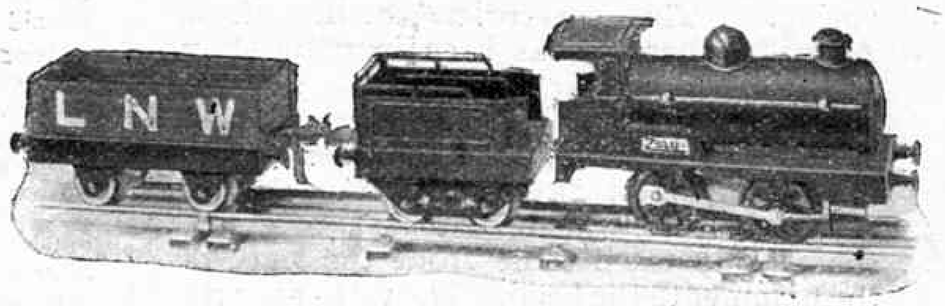


ZULU CLOCK WORK TRAINS

Fine and durable mechanism, and strength of construction in all parts are the main characteristics of Zulu Clockwork Trains.



The Locos are well designed and efficient, and will give long and excellent service.

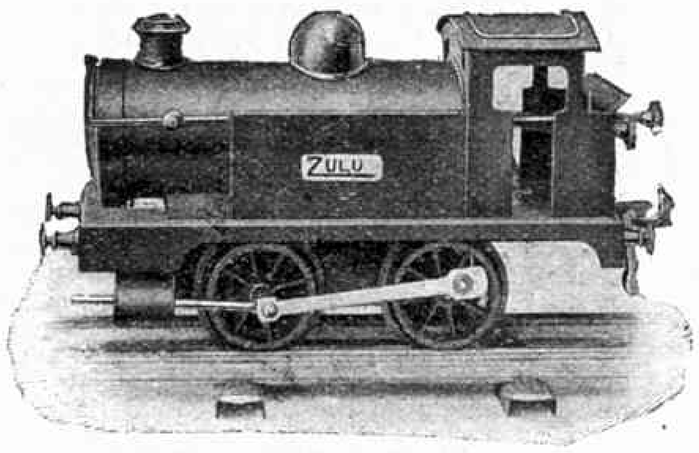


ZULU PASSENGER SET

This Set contains Loco, Tender, two Passenger Coaches and Rails. Gauge 0, in black only. Packed in strong cardboard box, price 25/–

ZULU GOODS SET

Contains Loco, Tender and Wagon and Rails. Gauge 0, n black only. Packed in strong cardboard box, price 18/6



ZULU TANK LOCO

A strong and durable Loco capable of any amount of hard work ; richly enamelled and highly finished; fitted with reversing gear, brake and governor. Gauge 0, in black only ... ... each 12/6

Full details of all Hornby and Zulu trains appear in the Meccano Products Booklet illustrated on opposite page. Read the conditions under which a copy of this splendid booklet will be sent you.
Illustrations and particulars of Train Accessories appear on page 176 of this issue.

For
MAS

MECCANO

ENGINEERING FOR BOYS

THE reason why you can build such wonderful models with Meccano is that every part is a real engineering piece—pulleys, gears, strips, girders, rods, couplings and cranks, each perfectly designed and accurately made. Every part is standardised and interchangeable.

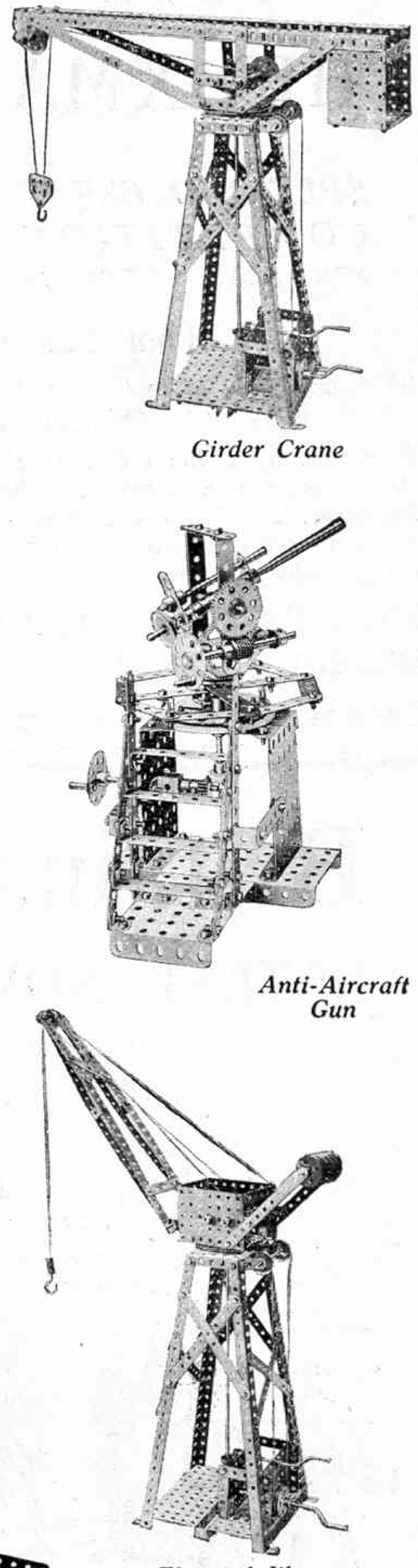
WHEN TO START

Anywhere between 5 and 70 is the correct age to start Meccano. The youngest boy may begin the moment he gets his Outfit home. A screw-driver and spanner are the only tools necessary, and even these are supplied. Every Outfit is complete—there is nothing further to buy.

HOW TO BEGIN

For convenience Meccano parts are sold in nine Outfits of varying size, numbered 00 to 7. The quality and finish of the parts are of the same high standard throughout the series, but as the Outfits increase in size they contain larger quantities and greater varieties of parts. Each Outfit may be converted into the one next higher by the purchase of an Accessory Outfit. Thus if a No. 2 is the first Outfit bought, it may be converted into a No. 3 by adding to it a No. 2a. A No. 3a would then convert it into a No. 4, and so on up to No. 7. In this way, no matter with what Outfit you commence, you may build it up by degrees to a No. 7 and so be able to make all of the many hundreds of models shown in the Books of Instructions. No study is needed.

These are a few of the hundreds of models that may be built with a No. 4 Outfit.



Girder Crane

Anti-Aircraft Gun

Elevated Jib Crane

Free to "*M.M.*" Readers

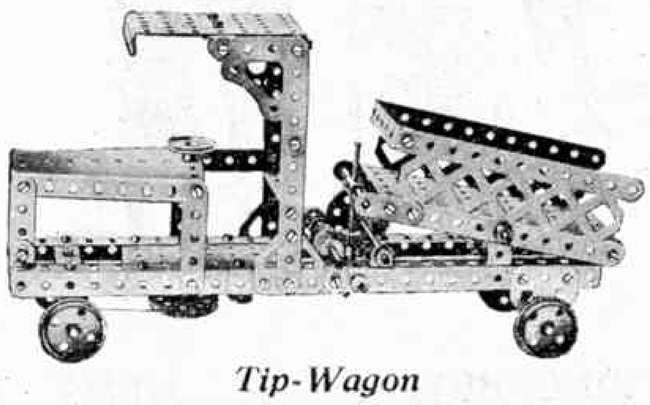
This splendidly-illustrated book tells of all the good things that come from Meccano-land, where the best toys are manufactured. It includes illustrations of all the Meccano Outfits from No. 00 to No. 7, and also shows all the Hornby and Zulu Train Sets, new Rolling Stock and Train Accessories. Full details of Rails, Points and Crossings are also given, and a complete list of Meccano Parts. Twenty pages of splendid Meccano Products!

HOW TO GET A FREE COPY

Just show this advertisement to three boys who do not take the "*M.M.*," and send us their names and addresses with your own. Address your letter to "Booklet" Department.

MECCANO PRICES

No.			No.		
00	Outfit ...	3/6	4	Outfit ...	40/–
0	,, ...	5/–	5	,, (carton)	55/–
1	,, ...	8/6	5	,, (wood)	85/–
2	,, ...	15/–	6	,, (carton)	105/–
3	,, ...	22/6	6	,, (wood)	140/–
			No. 7 Outfit	(wood)	370/–



Tip-Wagon

BUY BRITISH TOYS THIS XMAS

SPLENDID ESSAY COMPETITION
FOR BOYS UNDER 14

This is the FIRST PRIZE in our SPLENDID ESSAY COMPETITION
(See below)

Model-de-Luxe Scooter

What You Have to Do

Write an Essay of not more than 500 words on "WHY WE SHOULD BUY BRITISH TOYS."

Then send it to the Editor of the "Meccano Magazine." State clearly your age, name and full address. Closing date 31st December, 1923. The Editor of the "M.M." has kindly consented to act as judge, and for the two best Essays we will give the following :—

FIRST PRIZE—Our Model-de-Luxe Scooter as Illustrated.
SECOND PRIZE—Our Popular Model with Solid Tyres.

The Auto-Scooter is The Sporty Toy for The Sporty Boy

Prices to suit all Pockets

MADE BY

The New Auto-Scooter Company

CHESTERGATE,
STOCKPORT,

and Stocked by all Leading Toyshops

Send for Lists of 6 Different Models

Britains Limited, Toy Soldier Makers, Lambton Road, LONDON, N. 19

LATEST NOVELTY The Model Home Farm Series. Perfect Models, strictly to scale. Make and finish exactly similar to our celebrated Metal Toy Soldiers.

Specialities :

Railway Station Sets

Complete as Illustrated.

CATALOGUE—POST FREE.

Prices to suit all Pockets.

MANUFACTURED BY W. Britain IN LONDON ENGLAND.
TRADE MARK

Ask your Dealer for them.

WHEN BUYING BRITAINS SOLDIERS SEE THAT THEY ARE BRITAINS.

Competition Corner

Essay Competition

This Competition, which was announced last month, is for the best essay on the subject :—

"What I Intend to Be, and Why."

Everyone of our readers has his ambitions, and no doubt the majority already have decided what they intend to be. Many wish to be Engineers or Electricians. Some have a taste for farming or wish to go abroad as Planters or Ranchers. Others wish to be Soldiers or Sailors, or to enter one of the professions and become Doctors, Lawyers, Accountants, etc.

Every boy has his place to fill in the great scheme of life, and I feel sure it will be of interest to learn what Meccano boys intend to be, and also to know why they are choosing that particular walk of life.

Essays, to be written on one side of the paper only, should not exceed 1000 words. A prize of Meccano goods to the value of £1/1/– (to be chosen from our current list) will be awarded for the best essay, and three Hawk-Eye cameras (taking pictures 3¼" × 2¼") made by Kodak Ltd., to the next best. The winning essay will be published in the "*M.M.*"

Closing date, 31st January, 1924 (Overseas 31st March).

ESSAY COMPETITION for "M.M." Stamp Collectors

This competition is open to all readers of the "*M.M.*" who are also stamp collectors. The subject is "WHY I COLLECT STAMPS." Limit your essay to 500 words; write neatly on one side of the paper only, with name, address and age on back of each sheet. First prize: Packet of Stamps value 10/6 to be chosen by the winner, from any firm advertising in the pages of the "*M.M.*" Make your choice when you send in your essay and give the necessary information, so that the stamps may be sent to you if you are the lucky winner. Closing date, 31st January next. (Overseas 31st May, 1924). Mark your envelope "Stamp Essay."

Are You an Artist?

IN response to numerous requests received from Meccano boys, I have pleasure in announcing a Drawing Competition. As mentioned in last month's Editorial on page 141, the subject of this competition is to be: "*The Editor of the "M.M." as I imagine him to be.*" In this competition the drawings may be of any size and the subject may be treated in any manner desired, i.e., it may be either in black and white, pencil, crayon or wash.

There are no restrictions, except that the drawing must, of course, be the unaided work of the competitor. The competition will be divided into two sections :—

(A) Boys under 12 years of age.

(B) Boys of 12 years of age and over.

A prize of a Hawk-Eye camera, manufactured by the Kodak Company, will be awarded in each section. The closing date is 29th February, 1924, in the United Kingdom, and for entries Overseas, 30th April, 1924. I hope to receive a large number of entries for this, our first drawing competition, which, if well supported, will be followed by other similar competitions. The winning drawings will be published in the April or May "*M.M.*"

Sixth Photographic Competition for Guild Members

Prizes will be awarded for the best indoor photograph of a Guild member or members, building a Meccano model. There will be two classes, (A) for members of 14 years of age and under, and (B) for members over 14 years of age. Closing date 29th February next. Prizes in each section, Meccano goods to the value of 10/6, to be chosen by the winners from the Meccano catalogue.

There is no Overseas section in this competition. The attention of Overseas readers is drawn to the Fifth Overseas Photo Competition, announced on this page.

Competition Closing Dates

1923	20 Dec.	Christmas Present
1924	31 Jan.	Essay.
	,,	Stamp Essay.
	29 Feb.	Drawing.
	,,	Sixth Photographic.
	15 April	£250 Championship.

Overseas Closing Dates

1923	30 Dec.	Holiday Essay.
	,,	Photo Essay.
1924	29 Feb.	Fifth Photographic.
	31 Mar.	Essay.
	30 April	Drawing.
	30 May	£250 Championship.

CHOOSE YOUR OWN CHRISTMAS PRESENT

CLOSING DATE, 20th DECEMBER.

It is a wonderful sensation to sit down and study illustrations and descriptions, and select your own Christmas presents. I want you to try it! I am going to make at least one boy happy by giving him just the very thing he wants, from amongst the articles advertised in the pages of this Special Christmas number of the "*M.M.*"

What You Have to Do

In order to experience the sensation of choosing your own presents you must look at *all* the articles advertised in these pages and decide which article you would like the postman to hand to you on Christmas morning. Write the name of it on the top of a postcard, marking it No. 1. Then write the name of the article that you would like second best and mark it No. 2. Do this with six articles altogether, write your own name and address at the bottom in very plain letters, and send the postcard to "Christmas Presents," *Meccano Magazine*, Binns Road, Liverpool.

To the boy whose list corresponds most nearly in order of merit with the total voting we will post the article that heads his list, to reach him on Christmas morning.

"Christmas Presents" postcards must reach us not later than December 20th.

MECCANO £250 CHAMPIONSHIP CONTEST

21 Cups and 460 Medals

In the 1923–4 Model Building Contest **21 Championship Cups, 110 Silver and 350 Bronze Medals** will be awarded, together with a number of Special Certificates of Merit. The total value of the prizes will amount to £250. The various countries have been divided into seven groups, and these, again, are divided into sections according to the age of the entrants.

The awards will be made for the best models submitted—particularly for those models that embody ingenious and original features. The winner of each cup will hold the title of "Meccano Champion" for his particular group and section for twelve months. The cups, which have been designed for us by a well-known firm, are of superb quality, and very handsome in appearance. Each cup will be engraved with the name of its winner, and provided with a suitable pedestal.

Meccano Gold Medallist

The competitor who submits the best model in the entire competition will be awarded a specially-designed Solid Gold Medal. He will be the "Meccano Gold Medallist" for a year, and his name will be engraved on the medal, which will, of course, remain his property. Full particulars and entry form may be obtained from any Meccano dealer, or will be mailed (post free) on request to the Editor.

OVERSEAS SECTION

"SHARP EYES"

The two best entries in the Overseas section were submitted by Master Alick Young, of 14, Trollope Street, Grahamstown, South Africa, and Master E. L. Thompson, of Russell Avenue, Lindfield, N.S.W., Australia, respectively, each of whom found over 100 mistakes. Mr. "X" has sent a Meccano Clockwork Motor to each of these boys and congratulates Masters Young and Thompson on their keen powers of observation and the wonderful patience they have shown in listing the errors.

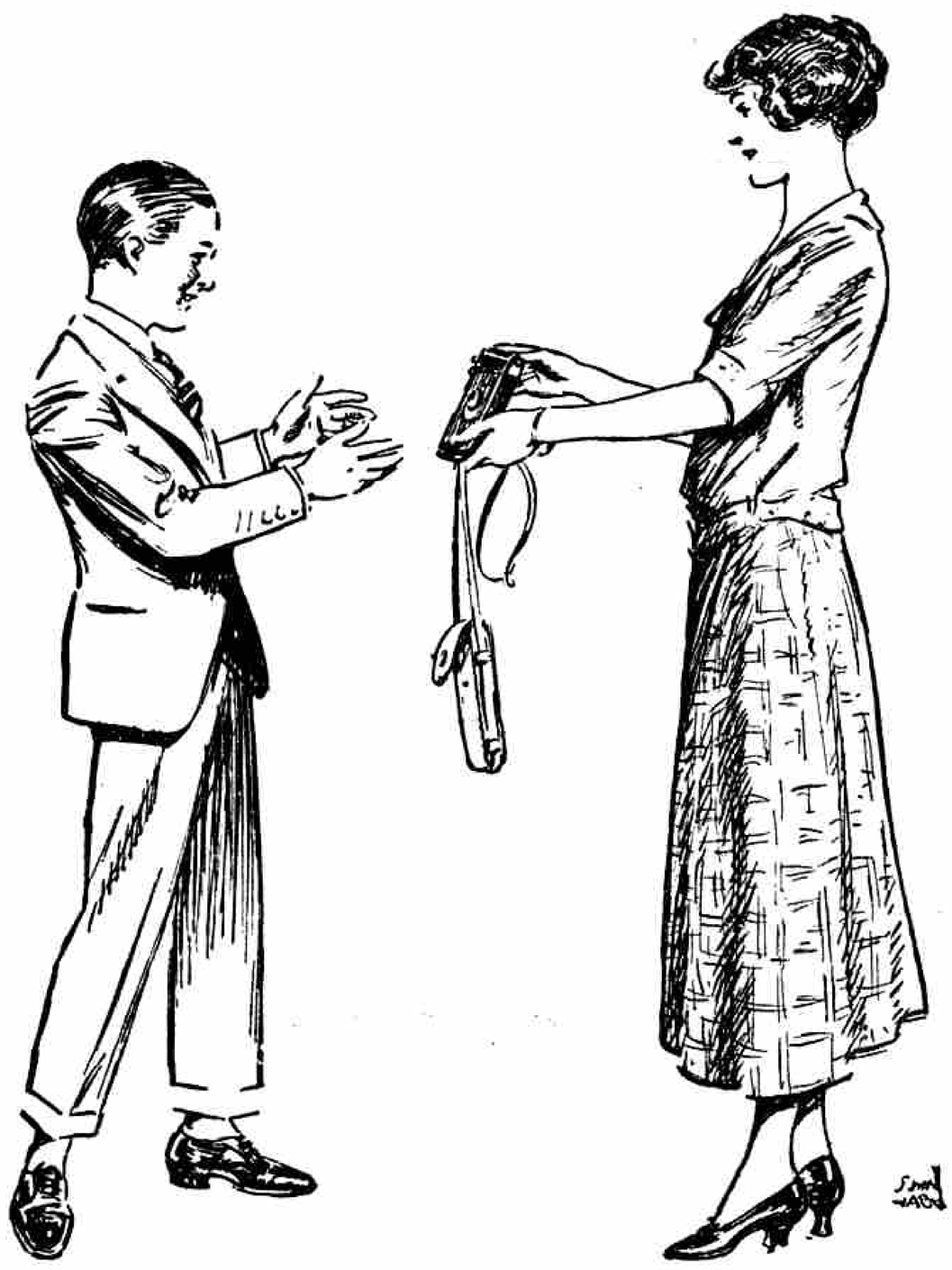
Overseas Fifth Photographic Competition

This competition closes on 29th February, 1924, and is divided into two sections, (A) 14 years of age and under, and (B) over 14 years of age. The subjects are (1) A Family Group, (2) An Animal Study, (3) Miscellaneous Section. The First Prize in each section is a Hawk-Eye Camera (taking pictures 3¼" × 2¼") made by the Kodak Co.

Improving the "*M.M.*"

Overseas Section

I have been overwhelmed with entries for this competition from almost every country in the world. Every entry has been carefully considered, and the best suggestions are those from Master J. A. Sadler, of Adelaide, S. Australia, to whom the first prize of a Hornby Train has been despatched. The second prize of a Zulu Tank Loco has been awarded to Master F. Whitney, Ficksburg, South Africa, and I congratulate these two competitors on their well-merited success. This has been one of our most successful competitions, and I wish to thank the hundreds of readers who wrote to me for the helpful spirit they showed.



Now boys! altogether for a

"Kodak"

Tell Dad you *must* have a 'Kodak' at Christmas. You can then make your own pictures of your own particular pastime; you can save forever the models you make; you can keep a picture record of your models in the course of construction; you can enter your very own pictures in your own magazine competitions. Ask Dad to take you to the nearest Kodak dealer. There are Brownies from 10/6 upwards —and you can learn to use any 'Kodak' or Brownie in half-an-hour.

Brownies from	10/6
Folding Autographic Brownies from	45/-
Vest Pocket Autographic Kodaks from	35/-
Autographic Kodaks Junior from ..	60/-

Kodak Ltd., Kingsway, London, W.C.2

Stamps with "Un-English" Names

In our last issue we mentioned that, broadly speaking, the stamps of all foreign countries may be divided into four main groups: (1) those on which the name of the country is in English spelling or nearly so, (2) those on which although the name is not in English it is in letters of the English alphabet, (3) those on which the name is in a foreign alphabet, and (4) those bearing no name of country.

We have already explained the classification of the first group and deal in this article with the remaining groups.

In group 2, where the word is entirely different from the English for the same place, but where the alphabet is still English, a little difficulty may be found at first. Below is a list of such names as you are likely to come across, with a key to the country under which they are classified. Those names that sound the same as the English when pronounced, or beginning the same, have been omitted.

Name on Stamp	Country
Bayern	Bavaria
Belgie, Belgique ...	Belgium.
Bosnien-Herzegowina	Bosnia and Herzgovina.
Ceskoslovenska ...	Czecho-Slovakia.
C.X.C.	Jugo-Slavia.
Danmark	Denmark.
Deutesche-Reichspost Deutsches Reich ...	Germany.
Deutsch	German (on German colonials as in "Deutsch Neu Guinea").
Eesti	Esthonia.
Éire, Éireann, Éireann	Irish Free State.
Emp. Ottomane ...	Turkey.
Espana	Spain.
Ethiopie	Abyssinia.
Haute	Upper (on French colonials, as in "Haute-Volta").
Helvetia	Switzerland.
K. Wurtt.	Wurtemburg.
Latvija	Lettland=Latvia.
Lietuva	Lithuania.
Magyar	Hungary.
Norge	Norway.
Oesterr, Oesterreich	Austria, or Austrian Levant, or Austrian Crete.
Polska, Poczta ...	Poland.
Sverige	Sweden.
Toga	Tonga (not the same as Togo).

This guide to the name of countries on stamps should prove of considerable use to beginners and to those a little more advanced who wish to revise their collections. The lists are not complete, however, as countries the stamps of which are rare, have been omitted.

Foreign Alphabets

Stamps that carry inscriptions in letters that are not the same as those of the English alphabet may only be identified by the use of a Key and by experience. Below is a Key that will be useful, and as it includes all the countries that readers of the "*M.M.*" are likely to come across it will enable stamps to be identified in almost every case.

The chief countries concerned are Greece, Crete. Bulgaria, Montenegro, Servia, Russia and Finland. Here are specimens of lettering on stamps of these countries.

Greece:	ΕΛΛΑΣ
Crete:	ΚΡΗΤΗ
Bulgaria:	БЪЛГАРСКА, ПОЩА, СТОТ, ФЕРДИНА, or БZЛГЛРИЯ
Montenegro:	БИЪЕГА ДОШТЕ ЦР. ГОРЕ
Servia:	ПОШТА, СРПСКА СРБИЈА
Russia or Finland, according to details of design of stamp:	ПОЧТОВАЯ МАРКА

Stamps having some portion of their design composed of what appears to be a daisy, belong to Japan. It is often said that the centre represents the Sun and the petals its rays. In reality, however, it represents a chrysanthemum, the national emblem of Japan.

In Group 4 there are no common stamps excepting those issued by Great Britain (which may be recognised by the portraits) and the Indian Native States.

Classifying in Sets

When the stamps have been identified and sorted into their respective countries, we may proceed to classify them according to their particular "sets." When this has been done we shall be ready to arrange them correctly in the album. As everyone knows, a set is a group of stamps issued about the same date. They may all be of similar design, although of differing colours and values, or they may be of varied design. For instance, the set now in use in Great Britain bears the portrait of King George V, and consists of fifteen different values between ½d. and 10/–. The long reign of Queen Victoria was marked by several sets, distinguished by differences in the portrait or in the frame of the stamps.

To classify the stamps of each country into their respective sets is difficult without the guidance to be obtained from a catalogue. Without a catalogue the collector is as much at sea as a tourist without a guide-book or map, or a sailor without a compass. It is better to spend a little money on a catalogue than to buy more stamps or even a larger album. A stamp catalogue is really a dealer's price list. It contains details and illustrations of all postage stamps known to have been issued to the date of publication. The stamps of each country are placed in their order of issue under the heading of the country to which they belong, with dates of issue and prices in unused and used condition. There are many useful catalogues, but readers of the "*M.M.*" will probably find the "Standard Catalogue of Postage Stamps"* to be most suitable, as it does not deal with the intricate details of stamps required by the advanced collector.

Next month we shall describe the preparation of the stamps for the album and their arrangement therein. We shall endeavour to assist the beginner in the choice of an album. In the meantime it may be found convenient to store the loose stamps in envelopes marked with the names of the respective countries, and arranged in alphabetical order for ready reference.

* Published by Messrs. Whitfield King & Co., Ipswich, price 6/6 post free.

SPECIAL ARTICLES I.

The King of Spain

as Baby, Boy and Man

Alphonso XII, King of Spain, died in 1886, a few months before his son was born. Accordingly his son, the present King, bearing the title of Alfonso XIII, commenced to reign at the date of his birth (17 May, 1886).

1889-1900

In 1889, when the young King was three years old, a series of postage stamps was issued, showing his baby portrait. In 1900, when he was fourteen, a new set was issued, showing him as a boy, and nine years later still another set was issued showing His Majesty as a man. This is, perhaps, the only case in which one person appears on stamps first as a baby, then as a boy, and lastly as a man.

1900-1909

The stamps of the last two sets are all numbered on the back in blue, except the 15c. of the 1909 issue, which sometimes has the number in blue and at other times in red. Every stamp on the same sheet has the same number, but every sheet has a different number. Postal officials are thus able to tell at once when a stamp was printed by looking at this number on the back. Sometimes, however, mistakes were made in the printing and so very occasionally different numbers are found on the same sheet. These errors are more valuable but, of course, they are not to be found in single stamps.

1909-1923

R.K.G.

Stamp Enquiries

F. Graham (Nottingham).—We hope to explain the different kinds of water-marks in one of our future issues. We shall also deal with the differences in perforations.

Geo. Williamson (Chester).—You will be interested to know that we are contemplating an article on engineering wonders of the world as depicted on stamps. We think this subject will be of great interest to Meccano boys who are stamp collectors.

G. Chapman (Luton).—Plate numbers in the English penny red stamps are to be found on the sides of the stamp in the column of tracery. We shall illustrate plate numbers and give interesting details in one of our future issues.

F. Johnson (Birmingham).—The article on this page will help you in the identification of your Greek stamp.

A. E. Lea (Cardiff).—We hope to deal with interesting new issues from time to time in this column. There are so many new issues, especially from the European countries, however, that to "give illustrations of every new issue each month" would require a very large number of pages. We shall select only the more interesting for description.

E. Partington (Leeds).—You are quite correct in supposing that "printing that has been put on a stamp wrong way up" increases its value. The technical description of this is an "inverted surcharge."

For Stamp Collectors

The attention of stamp collectors is drawn to the Special Essay Competition announced on page 193 of this issue.

FREE *MECCANO OUTFITS.*

YOU *MUST* enter the simple and fascinating Competition in this week's "*Scout.*" Besides Meccano Outfits there are many other Splendid Prizes, including

CHRISTMAS CARD AND CALENDAR *also given free inside every copy of THE*

TUCK HAMPERS,
FRETWORK OUTFITS,
CONJURING OUTFITS,
FOUNTAIN PENS,
FOOTBALLS, Etc., Etc.

Don't miss the first instalment of our new thrilling Serial "THE RIVER RIDERS."

SCOUT *XMAS No. just out--2d.*

FREE SAMPLE OF FELS-NAPTHA

Send for it!

Send a post card, giving your name and address, to A. C. Fincken & Co., Sole Consignees (Dept. 90A), 197, Gt. Portland Street, London, W.1.

Now Boys! what do you know about SOAP?

Who said "nothing"? Take no notice of him. He himself is probably ignorant of the fact that even the greatest scientists do not know *all* there is to know about soap, in spite of the fact that they use it every day of their lives! However, any boy can find out enough about soap to be able to tell mother if she is using a good one or not. All dirt is held to fabrics by a thin film of invisible oil. Ordinary soap breaks up this film and allows the water to get at the dirt and swill it away. But it won't come away without boiling and rubbing the clothes first. That's why mother so dislikes washdays. They mean such hard work. FELS-NAPTHA Soap is different. It has real naptha in it. Naptha *dissolves* grease. The clothes just have to be soaped with it and soaked in warm water. The stubborn oil film is gently dissolved away and the soapy water loosens the dirt. Then a rinse swills the dirt away, and the washing is done, quickly, easily, safely. Which method is the easier? The second, undoubtedly. Give mother a surprise! Send for a free sample of FELS-NAPTHA, explain to her how to use it (the directions are inside the wrapper) and never more will she have to endure the old-fashioned wash-day. *Won't* mother be pleased! Send to-day.

FELS-NAPTHA SOAP

FELS-NAPTHA COSTS **5½d.** A BAR, AND WASHES WITHOUT BOILING WATER.

Fireside Fun

THERE is a curious sentence that many of us were asked to say when we first went to school. Here it is:—"Of all the saws that ever I saw I never saw a saw that saws like this saw saws." That is not difficult to say, but there are many sentences with the same word, syllable or sound that *are* difficult, especially when we try to repeat them several times in quick succession. These sentences are called tongue-twisters. "Truly rural" and "A pound of mixed biscuits" seem quite simple expressions, and yet there are very few people who can say either of them quickly, several times running, without twisting them into something that sounds like "toorelooral" and "missed bixis."

A well-known tongue-twister, a favourite even in our grandfathers' times, is the verse:

Peter Piper picked a peck of pepper;
Did Peter Piper pick a peck of pepper?
If Peter Piper picked a peck of pepper,
Where's the peck of pepper Peter Piper picked?

Here is another similar form of tongue-twister in the verse:

Oliver Oglethorpe ogled an owl and oyster;
Did Oliver Oglethorpe ogle an owl and oyster?
If Oliver Oglethorpe ogled an owl and oyster,
Where are the owl and oyster Oliver Oglethorpe ogled?

These verses should be repeated half-a-dozen times, as quickly as possible. Anyone who does this without a slip may spend Christmas with a clear conscience!

Perhaps even more difficult to repeat than either of these is a verse in which the letter q occurs in almost every word.

Quixote Quicksight quizzed a queerish quid-box.
Did Quixote Quicksight quiz a queerish quid-box.
If Quixote Quicksight quizzed a queerish quid-box,
Where's the queerish quid-box Quixote Quicksight quizzed?

* * *

Sandy (receiving doctor's bill)—"But the bill is not right, Doctor. You've chairged me for seven days insteed o' six. Dinna ye mind I was dileerious one day, and was not aweer of your presence?"

* * *

A little boy complained that his shoes hurt him. His mother looked at them and saw that in his hurry to get dressed he had put the right shoe on the left foot, and the left shoe on the right foot.

"You've put your shoes on the wrong feet, dear," she explained.

The little boy looked up in wonder. "No, I haven't, mummy," he said, "*They're on my feet.*"

Adam and Eve Ate Lots of Apples

The vicar said he felt sure they only ate 1.

The curate said he didn't think that could be right because Eve 81 and Adam 812. Total 893.

The warden said that both were quite mistaken, because Eve 814 herself and Adam 8124 himself. Total 8938.

The sexton thought they were all wrong. He said that Eve 8142 know how it tasted, and Adam 28142 know what it was like. Total 36284.

Is anyone able to improve on this?

We are offering a prize of 5/- for the best puzzle submitted each month, and prizes of 2/6 each for any other puzzles printed.

Puzzles should be expressed as clearly as possible and the answers should be given in each case. Diagrams should be clearly drawn and letters should be addressed "Puzzles," Meccano Magazine, Binns Road, Liverpool.

We hope to announce next month a special Puzzle Competition for Guild Members.

A lady, who was engaging a new maid, showed the girl a valuable Persian rug, of which she was very proud. Pointing to the rug she said "When you clean the parlour, Mary, be very careful of this beautiful rug. It is very old!" "I can see it is, ma'am" replied the maid sympathetically, "but I dare say we can make it last the winter if we're careful!"

* * *

"Did you ever ride a horse before?" shouted the sergeant. "Never" replied the recruit. "Ah!" returned the sergeant with a sour smile, "Here's just the animal for you! He's never been ridden before. You can start out together!"

* * *

Officer (angrily): "Button up your coat."

Married recruit (absent-mindedly): "Yes, my dear!"

* * *

A young man while fishing on the Wye landed a wallet containing twenty-two £1 Treasury notes. A correspondent writing from North of the Tweed enquires what bait the fellow was using.

Try this on Father!

Tell him to think of the number of the month of his birth, counting January as 1 etc. Multiply it by 2; add 5; multiply it by 50; tell him then to add his age; then subtract 365; then add 115. The month of his birth will then be indicated by the first figure and the age by the last two figures.

* * *

Can you do this in an Hour?

ENIZAGAMONOMAGAZINE
NIZAGAMONANOMAGAZIN
IZAGAMONACANOMAGAZI
ZAGAMONACCCANOMAGAZ
AGAMONACCECCANOMAGA
GAMONACCEMECCANOMAG
AMONACCEMEMECCANOMA
MONACCEMEHEMECCANOM
ONACCEMEHTHEMECCANO
MONACCEMEHEMECCANOM
AMONACCEMEMECCANOMA
GAMONACCEMECCANOMAG
AGAMONACCECCANOMAGA
ZAGAMONACCCANOMAGAZ
IZAGAMONACANOMAGAZI
NIZAGAMONANOMAGAZIN
ENIZAGAMONOMAGAZINE

Starting with the T in the middle of the above parallelogram of letters, how many times can you find the words, "*The Meccano Magazine?*" You must always read in a straight line, but you are allowed to turn at right angles as often as you please.

By permission of] ["*The Captain*"

Pat, with the aid of the Meccano Outfit Aunt Maria gave him, "remodels" her precious Binks (who is getting rather fat) as a 2-4-2 Tank locomotive!

BUILD A HOUSE

SPECIAL OFFER to Meccano Boys

WE have a limited number of model house sets which we have decided to offer at special prices to all readers of the "Meccano Magazine."

These model houses are beautifully printed on stout card, and the material for each model is contained in a special envelope, on the outside of which is shown a picture of the model when made up.

All that is necessary to make a house is to cut and score the card as shown in the clear instructions given with each set. The parts are then built up by affixing them with a little SECCOTINE. When the model is complete, additions such as red roofs, plaster walls, gardens, etc., can be made as desired by the modeller, and much ingenuity can be exercised in the making of these additions. We give three suggestions :—

1. Grass can be indicated by smearing the base card with a thin solution of SECCOTINE, and then imitation or real moss attached. This is very effective, especially as footpaths can be shown by leaving the moss and Seccotine off where desired.
2. Plaster walls can easily be made by smearing the sides of the house with Seccotine, and then ordinary sand sprinkled over.
3. Windows can be made by sticking small pieces of glass or clear gelatine into the spaces allowed for the panes.

These models can be used in many attractive ways in conjunction with Hornby Trains and rail sets.

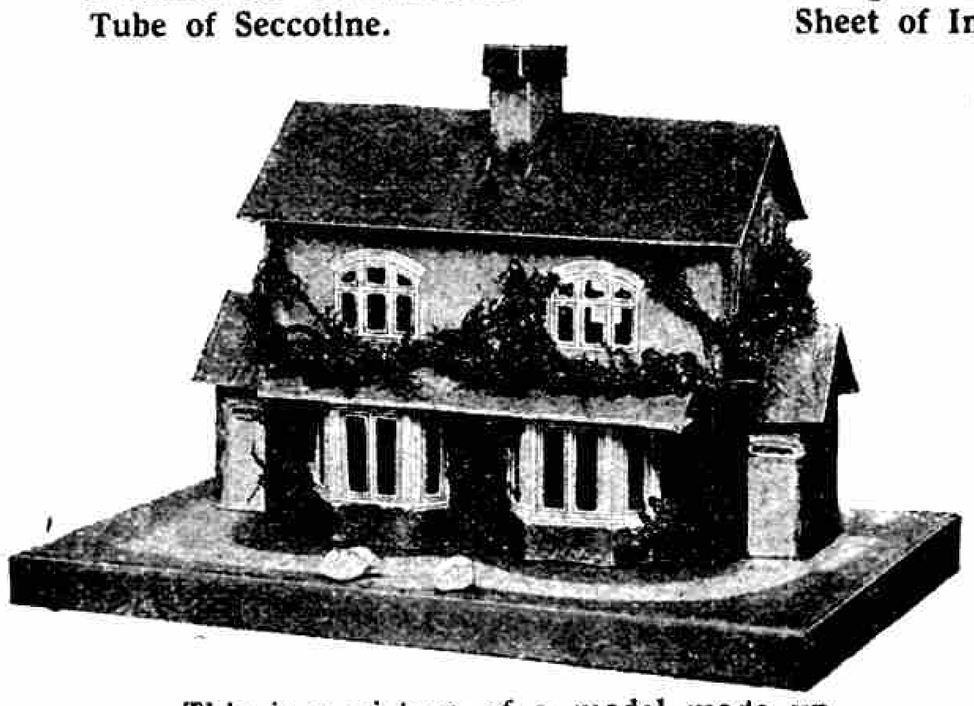
The list of models available is :—

Model No. 1—Two Semi-Detached Villas ... ...
„ „ 2—Detached House, to stand in its own grounds ... ...
„ „ 3— „ „ „ ... ...
„ „ 4—(a) Village School, (b) Two Semi-Detached Villas, (c) Villa ... ...
„ „ 5—(a) Church, (b) Blacksmith's Forge, (c) Village Shop ... ...
„ „ 6—(a) Villa, (b) Cottage, (c) Village Inn ... ...
„ „ 7—(a) Row of Cottages, (b) Detached House, (c) Monument ... ...

Any Box for 1/6 Postage Paid

EACH BOX CONTAINS

Material for Construction.
Tube of Seccotine.
Straight Edge.
Sheet of Instructions.



This is a picture of a model made up.

Fill in the attached Coupon and send it to us with a Post Office Order covering the boxes required, and by return you will have the sets ready for working on

COUPON

To be cut out and forwarded with Postal Order for number of boxes required.

Please send

.....Box..... Model House No. 1
..... „ „ „ „ 2
..... „ „ „ „ 3
..... „ „ „ „ 4
..... „ „ „ „ 5
..... „ „ „ „ 6
..... „ „ „ „ 7

at 1/6 per box post paid.

Name .....

Full Address .....

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McCAW, STEVENSON & ORR LTD.

The Linenhall Works, BELFAST

SOLE MAKERS OF **SECCOTINE** Which Sticks Everything

The Secretary's Notes

I wish you boys, members of this great Meccano brotherhood, could spend a day at my elbow. I wish you could share my pleasures in seeing how the scope of the Guild is increasing every day. I wish you could see how new members are joining us by the hundred every week, how numerous new Clubs are being formed every month, and what great promise these new Clubs hold for future development. Many of these new Clubs are being founded at the suggestion of local gentlemen, who realise what splendid work may be done through the medium of a real live Club.

Progress of the Guild

The Guild movement, the largest brotherhood of boys in the world, has been a great success ever since its inception some four years ago. I am not content to rest with the success that has been achieved, however, and I want to make the Guild an even greater success. In the first place I want to be sure that every member is getting the best out of the Guild. To make this possible, it is important that all individual members should support the Club in their district. Clubs have now been formed in nearly all large towns in this country, as well as in many countries Overseas, and if any of you who read these lines have not joined a Club you are missing heaps of fun. I hope that you will support your local Club, and shall be glad to send you full particulars of the nearest Club on request. Should there not be any Club established in your neighbourhood you should have a talk with your chums and see if you cannot form one together. I am always ready to give all the information and advice possible and to help in any way in my power, not only by assisting in starting new Clubs, but also in making them a success once they have been opened.

Join a Club

Many boys have written to ask me how to start a Club, and I think that a few words in this column will be of interest to new Guild members. The first step in starting a Club is to obtain a copy of the booklet "*Suggestions for Club Secretaries.*" This will be mailed, post free, on request. It tells you just how to set to work and shows that the essentials of a successful Club are a proper Club room and an adult Leader. These sometimes present difficulties, but my experience is that both are absolutely necessary to the successful working of a new Club. The difficulties are not so great as they may appear at first sight, however, and it is surprising to find how people will help if they know just what you want.

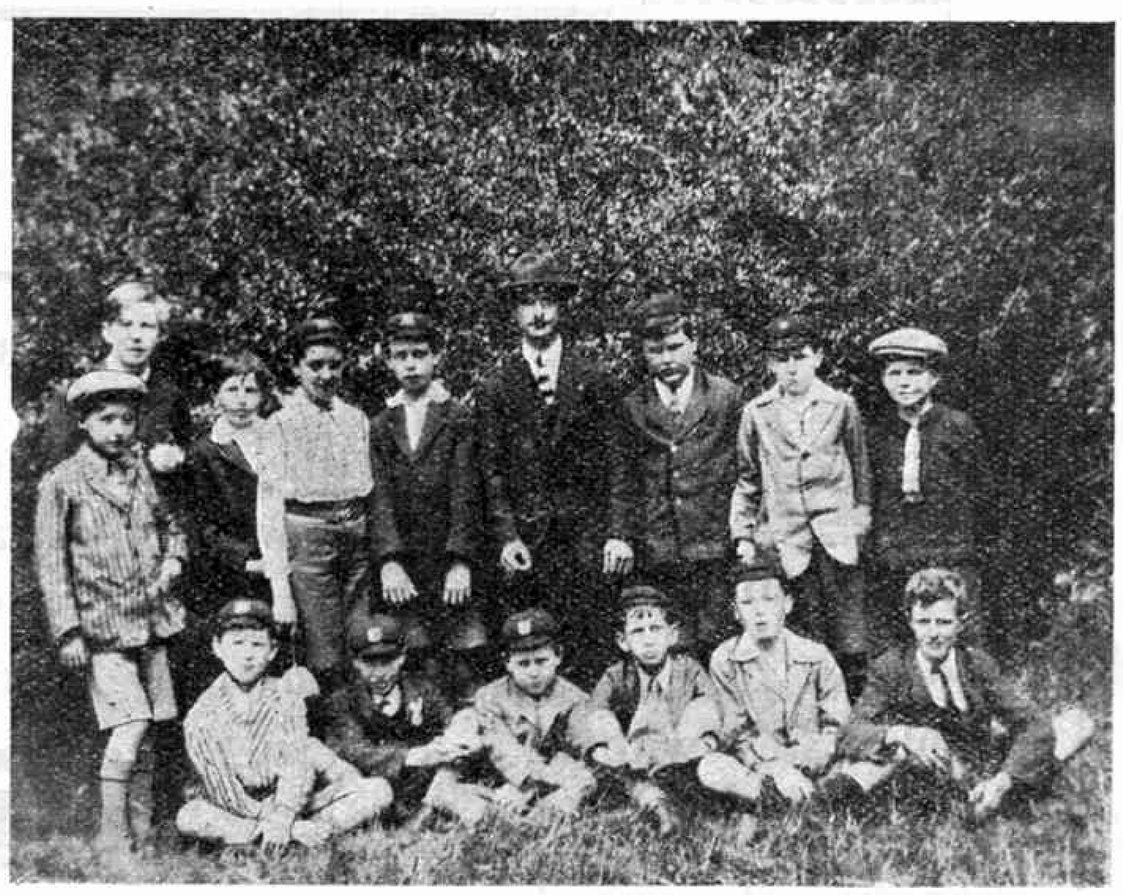
Starting a Club

In regard to obtaining a Leader, my advice is that you should approach your schoolmaster, Sunday-school teacher, or local Y.M.C.A. Secretary on the subject. Any of these gentlemen will be willing to help you, if they are able to do so. Should you experience any difficulty, however, I am always pleased to endeavour to obtain Leaders. Similarly, in the obtaining of a Club room I offer to write to local authorities on the subject and to interest local gentlemen in the work of the Club.

I want you to realise, however, that you must only appeal to me as a last resource. The successful working of a Club depends upon the Guild members on the spot. Unless they are prepared to work hard, both in the formation of the Club and afterwards, no Club will be successful. "What is worth doing at all, is worth doing well" is an old saying which still holds good in regard to many things, but in regard to forming a Meccano Club in particular. If the members are keen and enthusiastic they will often be able to arrange for both a Club Leader and a Club room without having to seek my assistance.

(*Continued in third column*

Club's Happy Outing



Pleasant memories of summer days and country rambles are recalled by this photograph of the Leader and members of the Southall Meccano Club. The photo was taken on the occasion of the Club's outing to Burnham Beeches, some very beautiful woods just outside London. We are well able to imagine that these happy-looking Guild members had a very jolly time out in the open. The Leader of the Southall M.C., Mr. G. Carpenter, who is seen in the centre of the group, has recently succeeded in obtaining a new and larger Club room to accommodate the steadily increasing membership of this enthusiastic Club.

Meccano Club Leaders

No. 8. Mr. H. W. R. COUSENS.

Mr. H. W. R. Cousens, the Leader of the "Westview (Nottingham) Meccano Club" took over the Leadership of this Club a little over a year ago. Since then

rapid progress has been made in every direction of the Club's activities, which are not confined to model-building, but include other hobbies introduced from the Leader's versatile store. The social side of the Club is not neglected and Mr. Cousens tells me that he derives great pleasure on Club nights in seeing the boys turn up with smiling faces in anticipation of a good time. I feel sure they are not disappointed and they are fortunate in having a leader who is so well able to cater for their many interests.

(*Continued from first column*)

In the October "*M.M.*" the Editor mentioned that the 1923 Meccano Model-building Competition is the biggest thing in Competitions of its kind ever held. He mentioned that his particular interest would be in the destination of the gold medal and the title "Meccano Gold Medallist." I should like to say that I also am particularly interested in this award, and I sincerely hope that the coveted title will be won by a member of our Guild. The Meccano Guild members have always been to the front in the list of prize-winners in this great annual Competition, and it will indeed be pleasing—not only to myself but also to the 30,000 members of the Guild—if one of our number carries off the supreme award in the Competition now running. Full particulars of the Competition are given elsewhere in these pages and I want all Guild members to "put their thinking caps on" and to devise a model that will do them justice.

Meccano Championship Competition

Remember that the award will be given for the best model in the whole Competition and that models are judged from the point of view of originality and ingenuity displayed. The boy who enters a model that is copied from some model in the Meccano Manuals cannot expect to win a prize. He has not exercised his brains or his inventive powers, the very thing that the Competition has been organised to bring about. It is not necessary to have a No. 7 Outfit to win a prize, but it is important that the models entered are built with skill and that the subjects selected are reproduced correctly and carefully. No boy who enters this Competition with a model that shows faulty construction or is badly built, can expect to win a prize. The title of "Meccano Gold Medallist" is one that thousands of boys covet, and the builder of the winning model will fully deserve the honour that the title conveys.

In some recent notes I announced that a number of Guild members in Canada were anxious to correspond with English boys. These Canadian members have now all been fixed up with correspondents in this country and they are enjoying exchanging letters with one another.

Correspondence Club

I have this last week received a number of names from the local Secretary of the French Meccano Guild. These French boys wish to correspond with English boys and they desire to write to their correspondents in English and to receive letters from them in French. This will be excellent practice for any Guild members who wish to improve their French, especially as there are no black marks or other penalties for any mistakes made! Any Guild member who wishes to open up correspondence with a French boy should send to me for full particulars of the Correspondence Club and enrolment form. Next month I hope to give a full list of boys abroad who desire me to find them correspondents in England.

Club Notes on Page 201

THE RAILWAYS OF GREAT BRITAIN

By G. GIBBARD JACKSON.

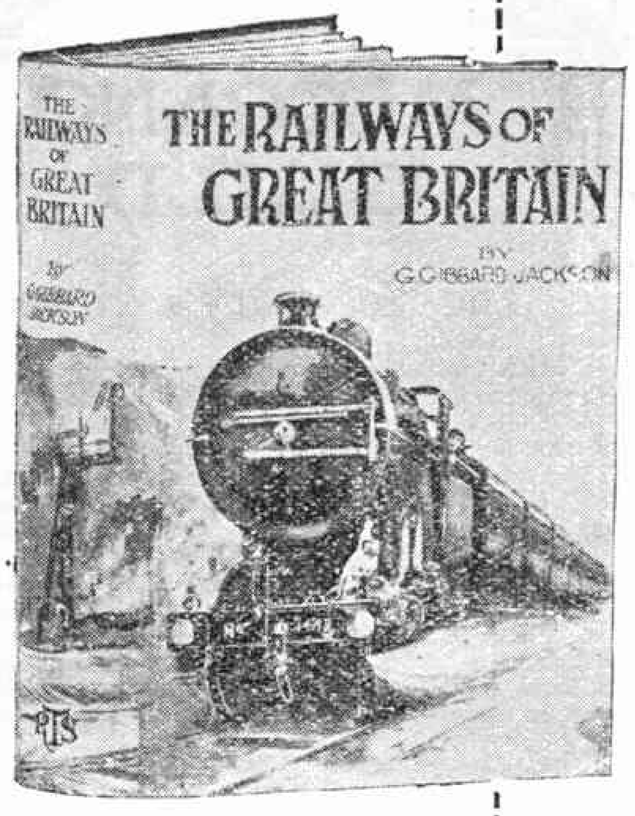
A NEW BOOK dealing in a popular way with the rise and progress of our railways.

With coloured frontispiece, 32 black and white illustrations, and attractive coloured picture wrappers.

Handsomely bound in cloth boards.

5/- NET.

No real boy will be satisfied until he gets this book, for it tells the wonderful story of how our railways came into being, and the marvellous advancement they have made.



THE SECRET OF CANUTE'S ISLAND.

By G. GODFRAY SELLICK.

With 6 full-page illustrations and attractive coloured picture wrapper.

A TALE OF A MYSTERIOUS HIDDEN HOARD AND ITS DISCOVERY

A FIFTH FORM MYSTERY.

By HAROLD AVERY.

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A BRISKLY EXCITING STORY OF SCHOOL LIFE.

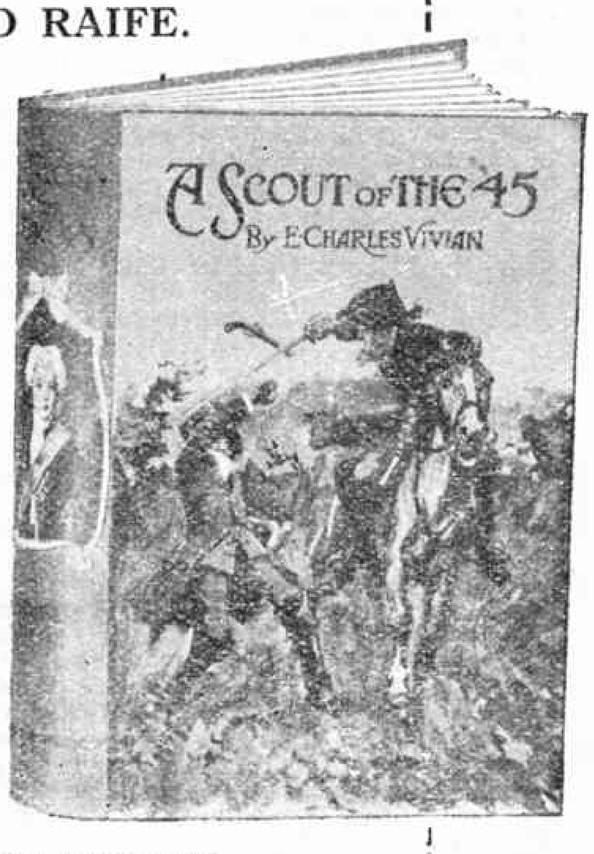
EACH **3/6** NET.

THE QUEST FOR THE ARCTIC POPPY.

By RAYMOND RAIFE.

With 6 full-page illustrations and attractive coloured picture wrapper.

A TALE OF THE GREAT ICE WASTES OF THE FAR NORTH.



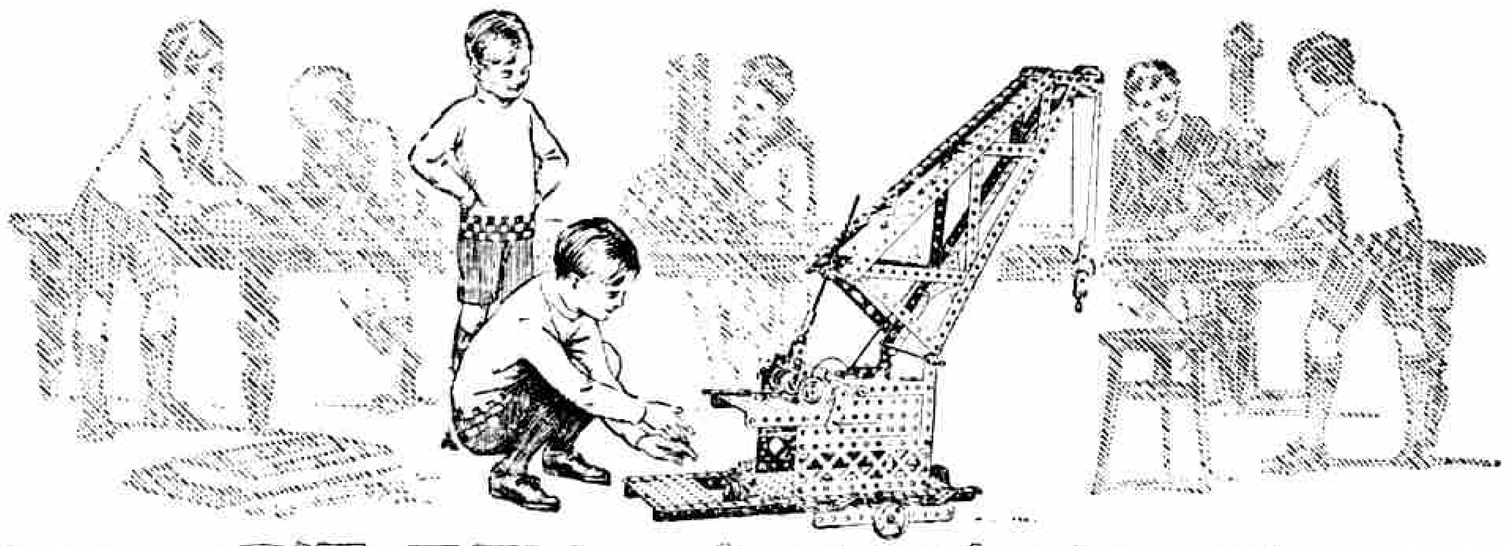
A SCOUT OF THE '45.

By E. CHARLES VIVIAN.

with 6 full-page illustrations and attractive coloured picture wrapper.

A MASTERPIECE OF DETECTIVE STORY, DEALING WITH THE JACOBITE RISING.

Published at the Office of
"THE BOY'S OWN PAPER,"
4, BOUVERIE ST., LONDON, E.C. 4.
OF ALL BOOKSHOPS, Etc.



CLUB NOTES

Luton M.C.—The first Winter Session is proving very successful. A Radio evening proved so popular that the Club Leader has decided to give a series of short lectures on the "Elementary Principles of Wireless." *Secretary:* Master W. Humby, 11, Napier Road, Luton, Beds.

Southall M.C.—This Club has recently succeeded in obtaining a new club room, so there is now more room for model building and entertainments. The room was obtained chiefly through the efforts of Mr. Haigh, the Vice-President, who is a good friend of long standing. *Secretary:* Master G. Gray, 26, St. John's Road, Southall.

Barnetby (St. Barnabas) M.C.—Club meetings are being held regularly, and Part 2 of the Meccano Lecture entitled "*The Story of our Ships*" was greatly enjoyed on a recent club night. The Club's football team promises to be a great asset. *Secretary:* Master R. H. Ward, Laurel Villas, Victoria Road, Barnetby, Lincs.

Leamington M.C.—Several new features have been included in the programme for the present Session. One of these is Boxing, in which the members are to be trained by a qualified instructor. Competitions are being arranged with other clubs in the town and I take this opportunity of wishing the Club every success. Club work is not neglected, and interesting lectures on all branches of engineering are delivered to the members from time to time, while other evenings are devoted to Club Competitions and model building. I hope to pay a visit to this Club in the near future. *Secretary:* Mr. G. Hare, 36, Willes Road, Leamington.

Wisbech M.C.—Owing to the rapidly-increasing membership of this Club, a Joint Leader, Mr. A. Beck, has recently been appointed, and his assistance will be greatly appreciated. The first anniversary of the Club was celebrated by a Social, which was voted a great success. *Secretary:* Master S. Ketteringham, 99, Norwich Road, New Walsoken, Wisbech.

Glevum (Gloucester) M.C.—In August last a camp was organised at Brimscombe, nr. Stroud, and many of the Club's members spent an enjoyable time on the Cotswolds, some 500 ft. above sea-level. Winter activities are now in full swing and the Club intend to install a wireless set, which will enable the members to listen to broadcast while building their models. The members attend a gymnasium every week. A concert party has been organised and toys are being made for the Children's Hospital for Christmas. *Club Leader*: Mr. L. C. Hobbs, 32, Vicarage Road, Gloucester.

House (Guernsey) M.C.—Winter activities have again commenced and many new members have joined. It is the Club's endeavour to make this a record Session, and there is certainly no lack of enthusiasm. *Secretary:* Master H. Griffith, Elizabeth College, Guernsey, C.I.

Bloemfontein (South Africa) M.C.—Interesting visits have been arranged to the local railway shops and printing works in addition to the ordinary Club programme. The Club members recently passed a vote of thanks to the Editor of the "*M.M.*" and unanimously decided that it was "just fine." *Secretary*: Master F. H. Lupton, 4, Loop Street, Bloemfontein, South Africa.

Sparkbrook M.C.—The programme for the present Session includes Lectures, Debates, Model Building, Speed Tests, Competitions, Games, Riddles, etc., and a Grand Social will be held later. An interesting evening will also be held on 3rd January, when members will each describe "How I Spent Christmas." *Secretary:* Master Francis Hubball, 71, Turner Street, Sparkbrook, Birmingham.

Ethersall Nelson M.C.—This newly-affiliated Club recently held an Exhibition, which was highly successful, both from a financial and general point of view. Many ingenious models have been constructed at the regular meetings, and last month an enjoyable visit was paid to the Printing Works of Messrs. H. W. Bateson & Son, of Barrowford, through the kindness of Master L. Horsfield, one of the members. After a tour through the works the boys listened to a Radio Concert from Manchester. The Secretary was recently awarded a Gold Medal for his achievements in the cricket field and I am sure that all the Guild members will join in congratulating him. *Secretary*: Master H. Dewhurst, 145, Waide House Road, Nelson, Lancs.

Clubs Recently Affiliated

Adelaide (South Australia) M.C.—This Meccano Club was formed a short time ago, and as excellent progress has already been made, affiliation with the Guild has now been granted. Some interesting meetings have been held, with Demonstrations, Lectures and Model Building. An interesting Lantern Lecture on "*Merrie England*" was very well received. *Secretary:* Master R. E. W. Cornish, Walkerville Terrace, Walkerville, Adelaide, South Australia.

Silchester M.C.—Established under the supervision of Mr. F. C. Harris, the Headmaster of the Silchester C. E. School, this Club has already made excellent progress. *Secretary:* Master A. Toms, Pine View, Silchester, near Reading, Berks.

Westcliff & District M.C.—Was established early last May, and affiliation with the Guild was granted towards the end of August. The members are keen and enthusiastic, and there is every prospect of a successful future. *Secretary:* Master D. S. Cecil, 22, Valkyrie Road, Westcliff-on-Sea.

Footscray (Australia) M.C.—This is the fifth Club in this country to become affiliated with the Guild, and, at the present rate of progress will soon become one of the leading Clubs in Australia. *Secretary:* Mr. H. L. Roach, 48, Stirling Street, Footscray, Victoria, Australia.

Clubs not yet Affiliated

Claughton (Birkenhead) M.C.—It is hoped to establish a Meccano Club in Birkenhead in the near future. All Guild Members who live near the Secretary should communicate with him without delay. *Secretary:* Master E. R. Hudson, 7, Upper Brassey Street, Birkenhead.

St. Helens Y.M.C.A. M.C.—A successful Club has been organised in St. Helens, and as soon as this comes under the supervision of an adult Club Leader it will be affiliated. Any St. Helens boys who are interested should call at the Junior Department of the Y.M.C.A. between the hours of 7 p.m. and 9 p.m. on Wednesdays or Fridays. *Secretary:* Master W. Mousdell, 14, Tennis Street, St. Helens, Lancs.

Albion Field (London, S.E. 13) M.C.—This Club has every prospect of being affiliated with the Guild at an early date, for already an adult Leader and Club room have been obtained. Meetings are held every Friday evening at 7 p.m., and any boy desirous of joining should communicate with the Secretary. *Secretary:* Master L. Jones, 39, Wellmeadow Road, Lewisham, S.E. 13.

Red Triangle (Halifax) M.C.—Every effort is being made to increase the membership of this promising Club. Any Guild boy living in Halifax will receive a cordial welcome. Full particulars of the Club may be obtained from the Secretary or from the Red Triangle Hut in Commercial Street. Club Meetings are held every Thursday evening. *Secretary:* Master E. Littlefair, 4, Clare Street, Halifax.

Lahore (India) M.C.—Has been in existence for some time, and when an Adult Club Leader is found will be affiliated with the Guild. One of the Club's most enthusiastic members died recently, and I feel sure that all Guild members will extend their sympathies to the Club in its sad loss. *Secretary:* Master H. C. Manchanda, 39, Ramour Mozang Road, Lahore, India.

Clubs Print Magazines

The Holy Trinity (Barnsbury, London, N.) is the first Meccano Club to issue a printed Magazine. The St. Mary (Newington) Meccano Club has not been far behind, however, for a copy of their Magazine reached me only a few weeks after the Magazine from the first-named Club. Both Magazines are similar in design, and both are printed by the Holy Trinity Meccano and Radio Club Press. The subscription is 1/- per annum or 1/6 (post free).

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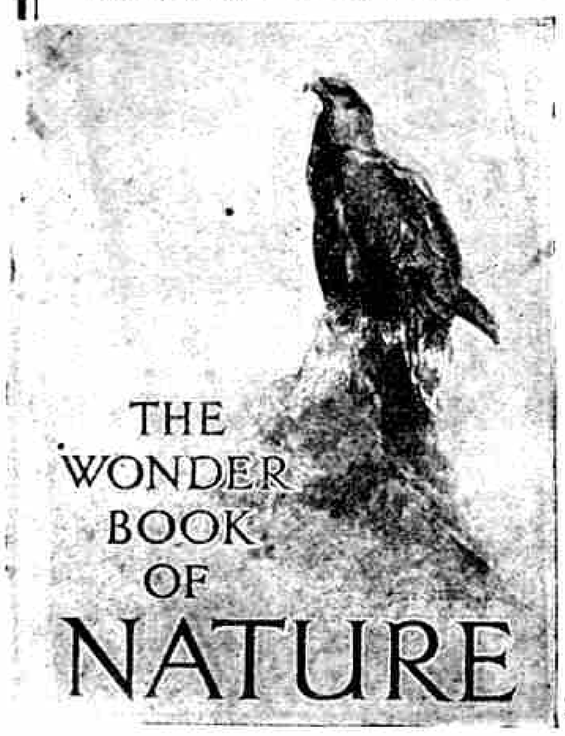

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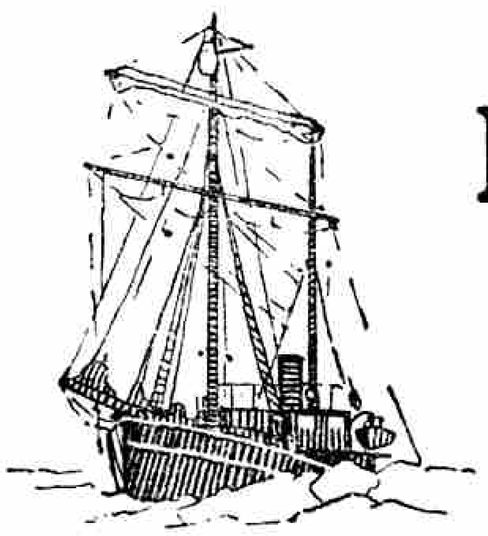

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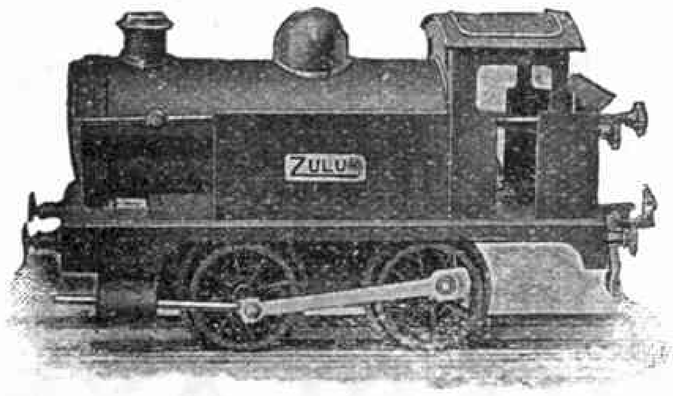

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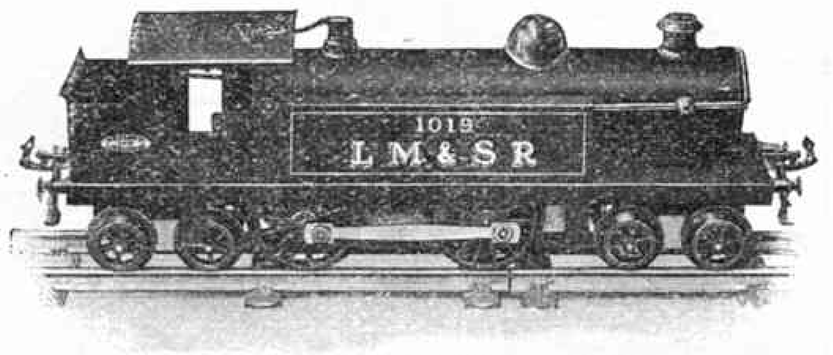

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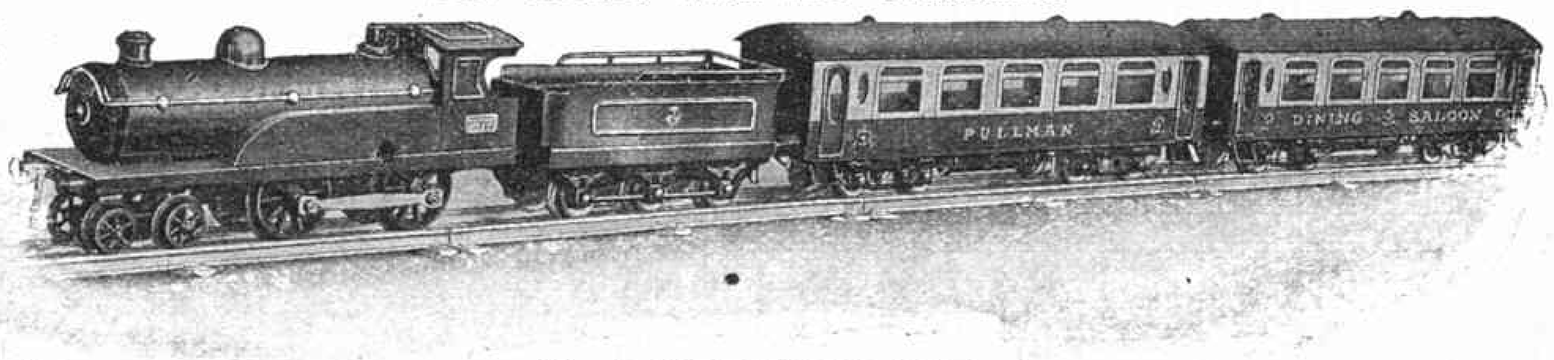

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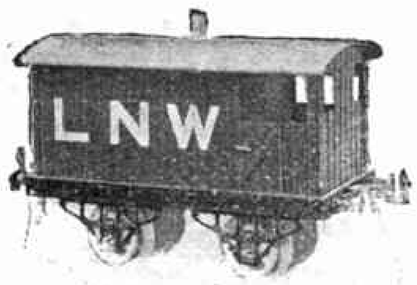

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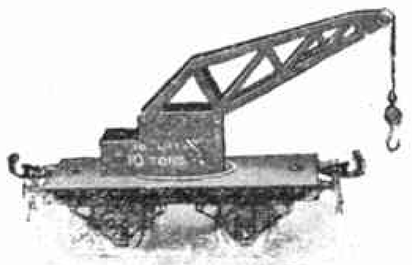

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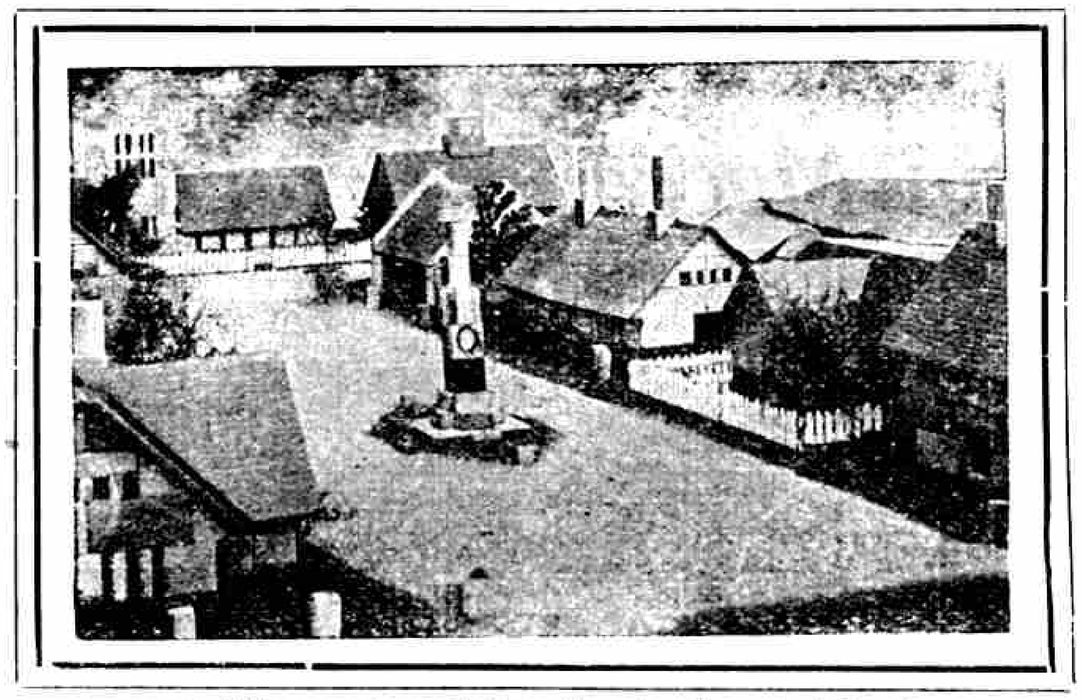

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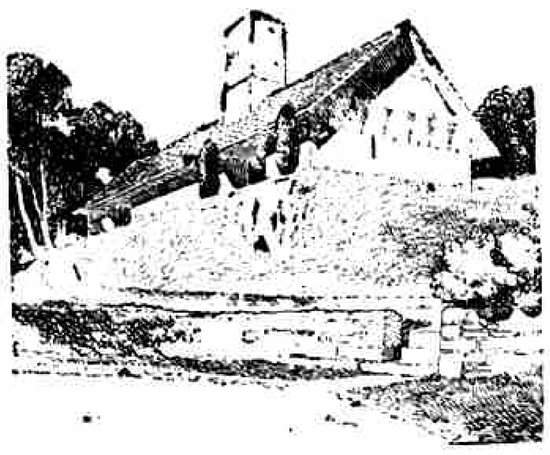

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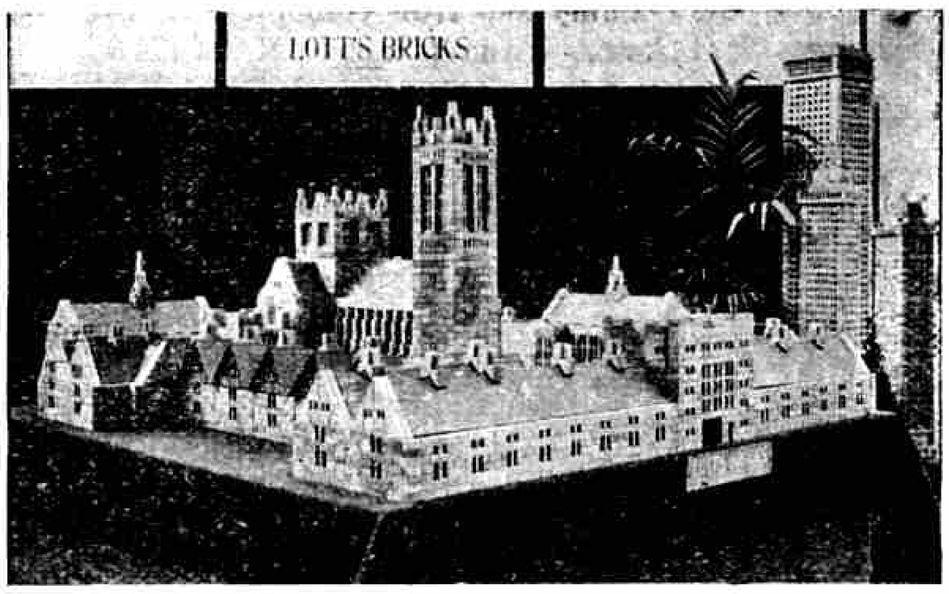

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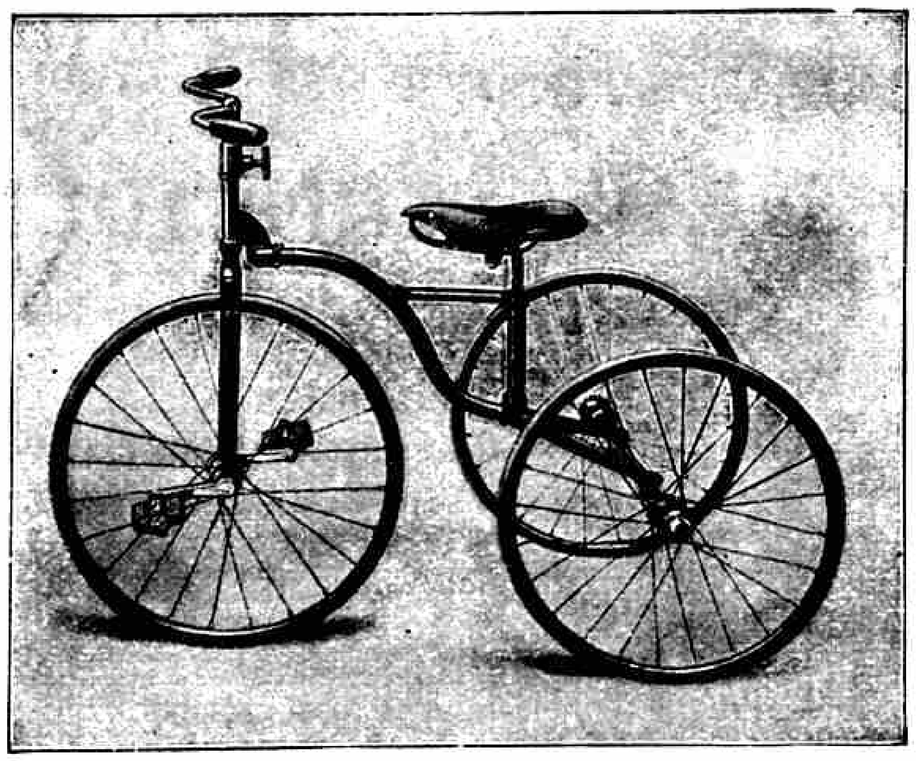

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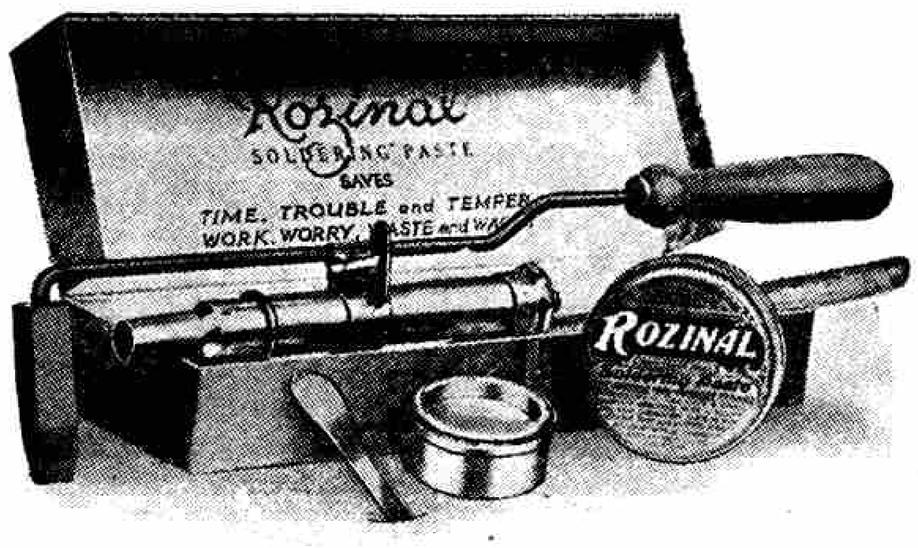

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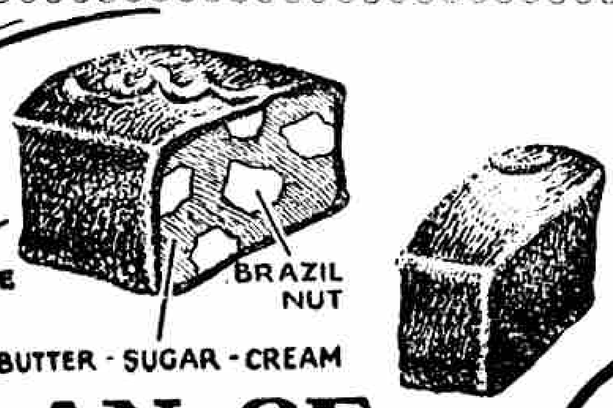

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PER 9D ¼lb. PLAIN per 8D ¼lb.

See how the new sweetmeat is made up, before being covered with rich chocolate! Buy this new and *better* sweet—make a habit of it. Always ask for

CHOCOLATE LILY BRAZILS

They are *new*—a change from the usual run of chocolates. A subtle flavour that appeals to all. You can buy the centres separately by just asking for CLARNICO LILY BRAZILS.

Made by

CLARNICO

—So they're Pure!

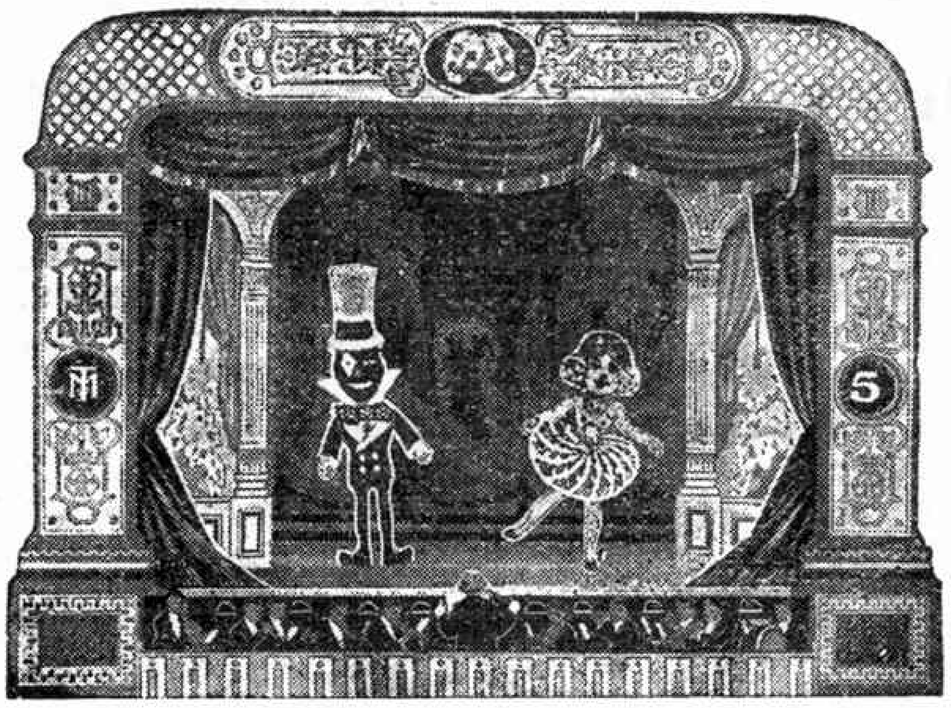
CLARKE NICKOLLS & COOMBS Ltd Victoria Park London

No. 11

Empire Theatre of Varieties

This is a beautiful and entertaining toy, with all the romance and glamour of the stage. The pleasure to be derived from the performance, given by the eight Artistes, is extreme. The show is a tremendous success at a Children's Party, and a supply of Programmes can be given round by the "Ushers." All the Stars are billed on Special Posters.

Price ... 6/- complete, Post free.

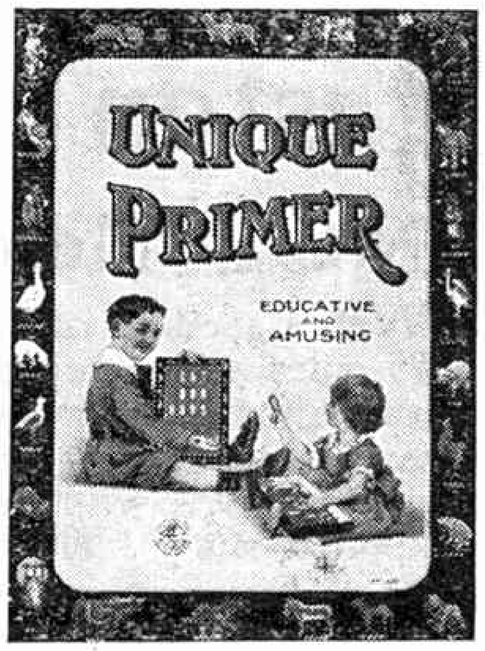


No. 14.
Nursery Playmates.

These Twin Dollies are extremely pretty and will please all little folk. You can dress them in the latest fashion, and according to the weather.

They can be at the Seaside or at a Tea Party.

Price 1/9 complete, Post free.



No. 12. Unique Primer.

This toy will keep the children happy for hours, and, at the same time, teach them how to form words. Strongly made. Will last a lifetime.

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Send for Full List of 21 Entertaining Toys

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MATHEWS' MODEL TOY FACTORY,

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Meccano Boys Keep Fit!!

Just a short time with the gloves each day will keep you in the best of condition for working out new Meccano models.

BOXING GLOVES

SET OF FOUR

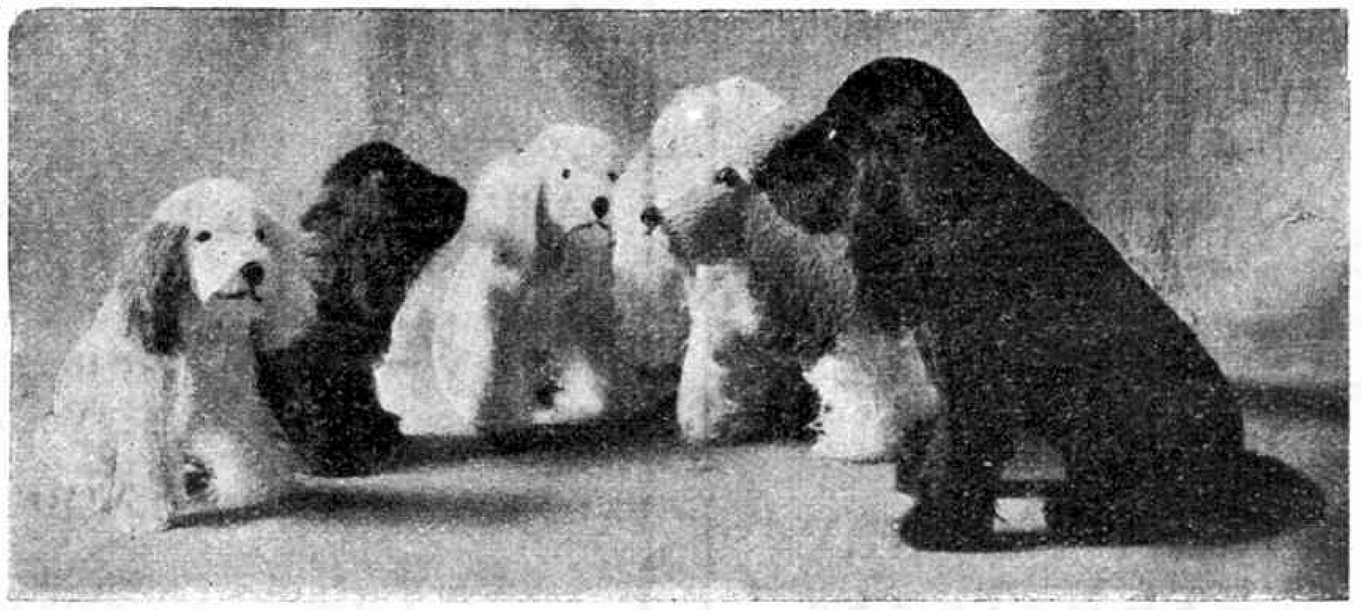
YOUTHS' SIZES

6/9	9/6	10/9 Pair
Twill Backs Leather Palms.	Tan Leather Elastic Wrist.	Tan Leather Laced Palms.

Postage and packing 6d. extra.

Odd & Sons,

55, North End, CROYDON,
111, High Street, SUTTON, Surrey.



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Of all Leading Stores.

EVERY TOY MARKED

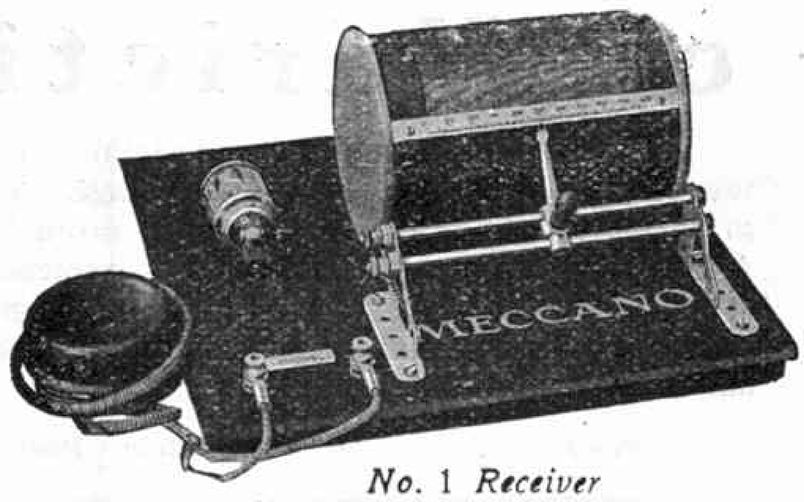
BEAUTIFUL AND LIFE-LIKE MODELS.

Listen with a Meccano Receiver

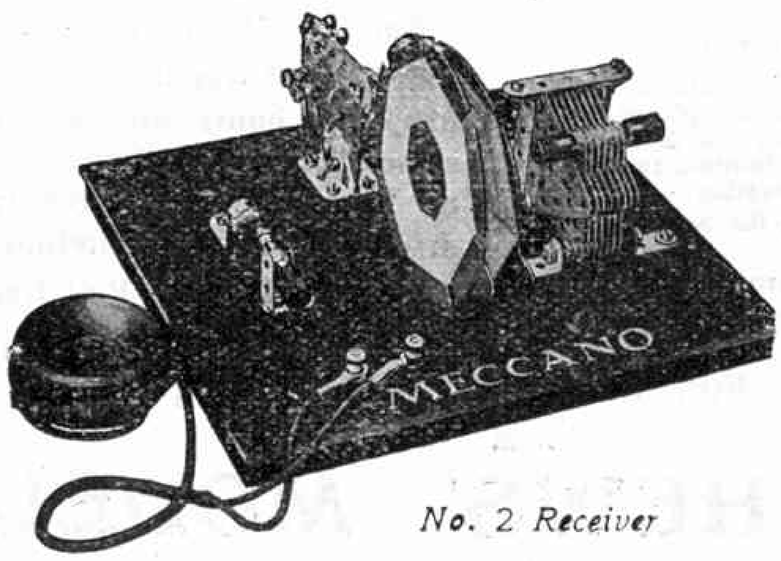
No. 1 Meccano Crystal Receiver

With a good aerial this set will receive telephony up to about 25 miles from a broadcasting station, and Morse signals up to a distance exceeding 100 miles. The set, which may be used with a broadcasting licence obtainable from any Post Office at a cost of 10/-, will receive on wave-lengths from zero to approximately 1,000 metres.

R.S. 1—Receiving Set complete, tested and guaranteed, price **29/-**
Compulsory Broadcasting Fee **1/-**
Price **30/-**



No. 1 Receiver



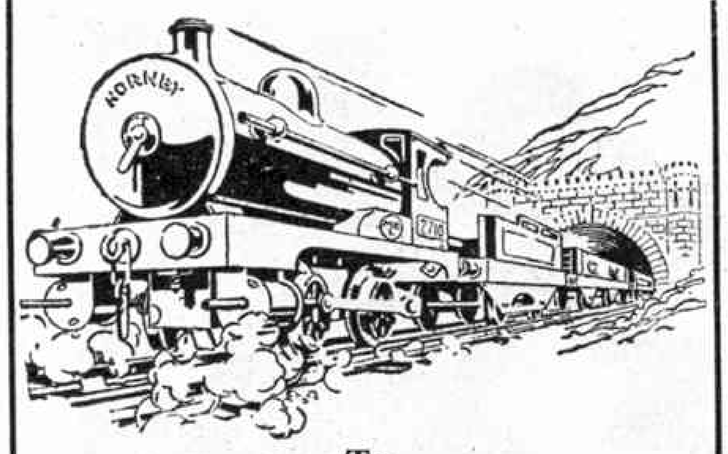
No. 2 Receiver

No. 2 Meccano Crystal Receiver

This set is of the constructional type and is specially adapted to the requirements of those who wish to carry out simple experiments. Its range is the same as that of No. 1 set described above, and it receives on wave-lengths of approximately 300-500 metres. It may only be used with a constructor's licence, which costs 15/-, and is obtainable from any Post Office.

R.S. 2—Complete Set of Parts, in strong carton, including single telephone 2,000 ohms resistance, price **25/-**
R.S. 2a—Complete Set of Parts, in strong carton, without telephone, price **15/-**

MECCANO LIMITED **BINNS ROAD** **LIVERPOOL**



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Model Railway Enthusiasts

Hornby Trains and Railway Accessories.

Meccano Outfits and Parts.

Agent for
L.M.C. and Bassett Lowke Model Railways, Hobbies Fretwork Outfits.

Over 60 feet of laid track for demonstrations.

Send Post Card for Catalogue.

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Hullo!!! C.Q., Will Day Calling

you to inspect his great selection of Up-to-date WIRELESS APPARATUS, suitable for XMAS and NEW YEAR GIFTS.

Complete Set of Parts ready for assembling to make a Crystal Receiving Set, in Box, Postage Paid 16/6 Set.

The WADE LATHE forms an Ideal Gift, £2 10 0

Variable Condensers. Special Features.

1 hole fixing to Panel, Tags for Connections, Adjustable Screw at Base. Fixed Vanes adjustable. Heavy Ebonite Ends. .001 **8/6** each. .0005 **7/-** each. .0003 **5/9** each. .0002 **5/-** each. Vernier **4/-** each.
Fitted with Ebonite Dial **1/2** each extra.
Packing and Postage **6**d. each extra.

Write for our new Catalogue. Now ready, sent post free. Postage and Carriage on all goods extra.

When you are tired of wasting both time and money on so-called Wireless Crystals, secure one of the new Super Marvel Crystals
DAYZITE (Regd.)
and put an end to all your troubles. Sold only boxed with Silver Cat's Whisker, **2/6** each. Postage **3**d. extra.

WILL DAY LTD.,

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'Phone: Regent 4577. Telegrams: "Titles, Westrand, London."

POLAR BLOK

THE MOST SIMPLE SYSTEM OF WIRELESS SET CONSTRUCTION

A COMPLETELY ASSEMBLED POLAR BLOK CRYSTAL SET IN A POLISHED WOOD CASE

THE SAME SET ON LEG SUPPORTS

POLAR BLOK enables you to build a wireless set to any circuit or design, and to change or extend it without waste or great cost, always preserving the finished appearance of first-class workmanship.

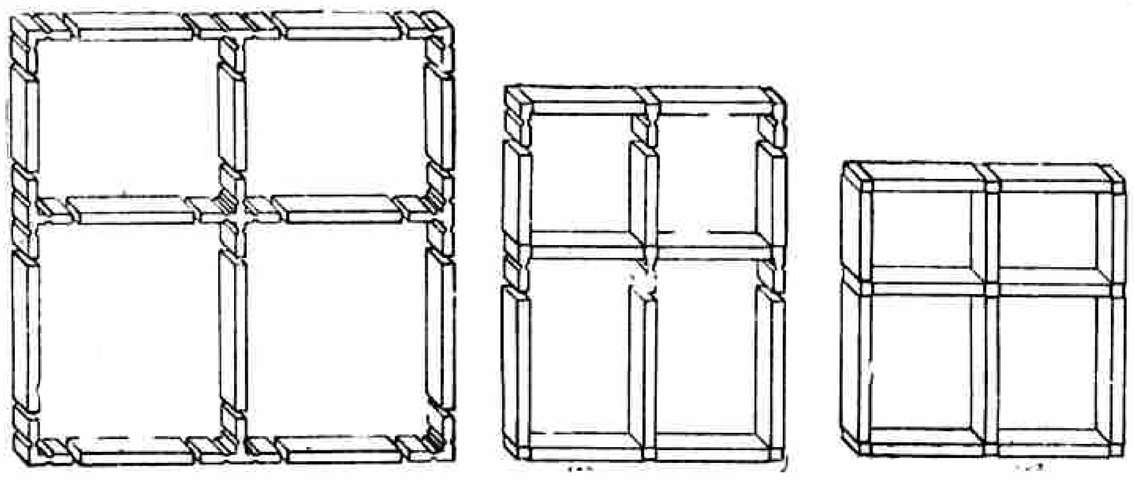
You begin with a simple framework built up in sections, from hollow steel tubes of standardized pattern. You fit these together by interlocking with die-cast alloy connecting-pieces easily snapped together by hand, without any tools whatsoever.

Your frame can be made to any standard size according to the kind of set you start with—and this size can be *extended at will* to allow for additional circuits and general enlargement or experiment.

Polar Blok components can be purchased mounted on standard panels, or alternatively the panels may be purchased separately, thus allowing you to mount components already in your possession.

Where appearance is not a necessary factor the set may be mounted on special metal legs as shewn—otherwise a polished wood case, also built in sections and secured by special clamps, completes a handsome and thoroughly efficient receiving set which anybody can build with the aid of the Polar Blok leaflets and booklet.

No soldered connections are necessary in wiring up the set. A small screwdriver and a pair of side cutting pliers are the only tools required. If you are at all interested in Wireless you cannot afford to miss this opportunity of knowing all about Polar Blok. See your nearest Polar Stockist or send us the coupon for full particulars



SHOWING HOW FRAMEWORK IS BUILT UP FROM STEEL TUBES AND CONNECTING PIECES

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Strand, W.C.2.

I enclose 5d.

Please send me the Polar Blok Booklet and your leaflets shewing various circuits from which I can construct a Polar Blok set.

Name .....

Address .....

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FLEET AD. CO.

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FOR SALE
(*See also pages* 211 *and* 212)

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100 Diff. Stamps Free, incl. Colonials, S. American, China, etc. (No Neurope) to applicants for appros. See my famous ½d. stamps. Fleming, Queen's Park, Chester.

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For 30 days only I am presenting all applicants for approvals with a Grand Pictorial Packet containing New Issues, Airpost, etc. Write to-day and save disappointment.
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Absolutely FREE to the first 25 applicants for my famous approvals.
Splendid Loose-Leaf Albums, only 4/6 each, postage 9d. extra. Titles of Countries, gummed, for these Albums, 1/– per set of 648 names. Free gift with each Album.
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Including Used and Unused British and French Colonials, also Newfoundland Caribou's, Kenya Colony, Canada, East Africa and Uganda, "China" on Hong Kong, and 4, 5, 10, 20, 30, 50 Million Marks of Germany, making a fine all-round collection.
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This **Grand Packet** containing Set of **Unused Austrian,** Set of **Unused Leichnenstein** and single stamps of **Bulgaria** (Palace), **Venezuela,** etc., sent **FREE** to all genuine applicants for my **Bargain Approvals.** Just send a **Postcard** (abroad 6d.)
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DON'T MISS THIS! HALF PRICE!
Special Xmas Packet contains 50 different including Zanzibar (Sultan), Guatemala (view of Cathedral), Dominican Republic (Arms), Indore Native State, Mauritius, Panama Rep., set of five Venezuela, etc. Splendid value, post free 1/– or 6d. only if you ask to see approvals.
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UNITED STATES unused PRESIDENT HARDING Memorial Stamp sent gratis to Collectors asking to see our world-renowned Approval Selections. Mention Gift N220.
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Set of Six Hayti, 1904 (abroad 3d.) Free to applicants for approval sheets, mentioning "*Meccano Magazine.*"
1,000 well assorted Stamps, price 9d., post free (abroad 1/–).
500 all different, price 2/6, post free (abroad 2/9).
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XMAS BARGAINS
150 Germany, all different, 2/6;
50 Poland, 1/–; 50 British Colonials, 1/–;
100 British Colonials, 2/6; 500 varieties, all different 5/–; 1000 varieties, all different, 12/6.
Special Packets—100 British Colonials, —100 British Colonials and Foreign, **10/6** each.
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To applicants asking to see my famous Approval Selection.
250 unused stamps, 1/3; 1000 different stamps, 4/3; 2000 different stamps, 15/–.
FLEMING, Queen's Park, CHESTER.

A Monster Bridge — (*cont. from p.* 183).

at the top, and will contain 35,000 tons of steel.

Although the towers will be constructed of steel, they will be faced with granite, and will thus appear to be columns of solid masonry. The bridge will be required to carry an immense weight, and therefore every part will be of very massive construction.

Heavy Anchorages

In order to counteract the tremendous pull of the cables, which it is calculated will amount to 25,000 tons, gigantic anchorages will be required. They will consist of huge masses of masonry, measuring 400 ft. in breadth at the base and tapering gracefully to the top, 200 ft. above ground level.

On each anchorage it is proposed to erect rectangular buildings, 250 ft. in breadth and 70 ft. in width, with a space of 100 ft. between their inner faces. The ground floor will be 200 ft. and the roof 500 ft. above road level. The accommodation provided by these new buildings will help to replace the property that it will be necessary to demolish to make room for the approaches, and their rents will furnish a source of revenue for the maintenance and repair of the bridge.

WANTED. Articles and photographs of general interest, suitable for publication in the "*Meccano Magazine.*" Accepted contributions will be paid for at our usual rates and will be returned if unaccepted, if stamped addressed envelope is enclosed. Although every care will be taken of same, no responsibility can be accepted for lost or mislaid manuscripts. THE EDITOR, "*Meccano Magazine,*" BINNS ROAD, LIVERPOOL.

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ONE STAMP	**catalogued**	**7s. 6d.**
Set 13 old German	**,,**	**6s. 0d.**
Set 13 Ukraine Pictorials	**,,**	**1s. 9d.**
SCARCE TEMESVAR	**,,**	**9d.**
Total catalogue value		**16s. 0d.**

We won't tell you what the 7/6 stamp is, and it will remain a mystery until you get it, but it will be a pleasant surprise.

Have You got a Temesvar Stamp?

These were used by the Hungarians when they captured the town from Roumania, and now the Roumanians have got it back. Only a limited number were issued, and we have been able to get a few. This enormous free gift is only to increase our list of Stamp Collectors and we reserve the right to refuse applications we consider unsatisfactory. This advertisement will never be repeated—don't delay—send a p.c. at once. Applications in rotation.

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ALL POST FREE.

1,000 Mixed Stamps, 1/- 4,000 for 3/9
Stamp Mounts, like glass, 1,000 for 5d.
All different Stamps, 500 for 4/-, 1,000 for 10/-
1,000 Mixed Unused Stamps for 4/6, 500 for 3/-
500 Different Unused Stamps from all parts of the World, 10/-

R. WILKINSON,
Stamp Dealer,
COLWYN BAY, 11.

Locomotive Engines

Magnificent Pictures
Printed in 11 Colours.
Size of each 20 × 12 ins.

Full Particulars of Dimensions.

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L.M.S. (Caledonian) No. 956
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Send twopence in stamps for postage and ask for free specimen "*Railway Magazine.*"

Address: *M.M.* Dept.
THE
Railway Publishing Co. Ltd.
33, Tothill Street,
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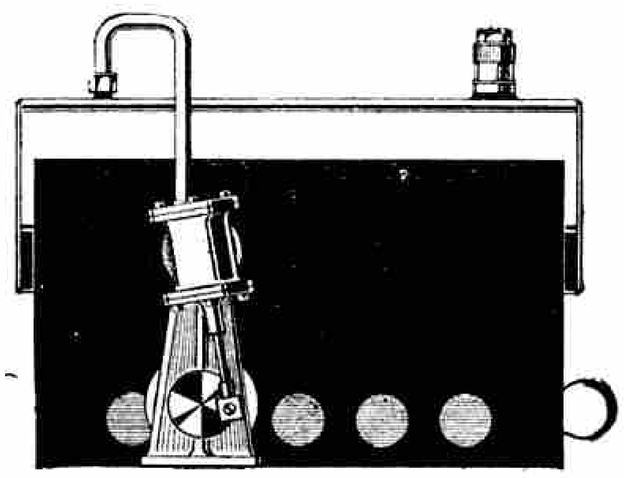

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with double-acting cylinder, 7/16 x 7/16 in.

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ENGINE PARTS, 5/-
Post 3d.
FINISHED BOILER, 7/6
Postage on Boiler or Complete Plant, 6d.

If you want a bigger engine send 6d. for our complete 72 pp. catalogue.

Stuart Turner Ltd.
ENGINEERS,
HENLEY-ON-THAMES.

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Do you want an EXCITING GAME for all at Christmas ?
WE HAVE IT !

THE THORNTON TABLE GAME

Provides
1. **Realistic and Scientific Football**
2. **Direct Control of the Ball**
3. **All the Thrills of a Cup Tie**

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(Advertised at 30/-)

Special Christmas Offer
(500 Games only)

Carr. 15/- Paid

This Advertisement must accompany Order.

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FOUNTAIN PENS for Xmas.

Splendid Smooth Writing Pens.

Give your father or your chum one for Xmas. Complete with filler, packed in strong box, regulation size.

Marked on box 10/6 Our price 1/9

Post Free any address.

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Stamps for Sale

(*see also pages* 210 *and* 211).

Fine Postage Stamps! Low Prices!!

Splendid Sets—8 Malta, 5d.; 6 China, 1d.; 6 Cyprus, 4d.; 6 Gibraltar, 4d.; 12 Phillipines, 8d.; 12 Portugal, 4d.; 12 Persia, 6d.; 20 Siam, 9d.; 20 Sweden, 6d.; 12 Denmark, 4d.; 12 Roumania, 4d.; etc., etc. Postage Free. Ask to see my new books of ½d. stamps, 2/6 per 100; or a superior class at 1d. each, 6/- per 100. Address:

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Your difficulties will be solved if you choose some of our marvellous **Sixpenny** Packets for yourself or give them to your friends.

6d. each or 12 for 5/-, 25 for 10/-, 50 for £1 (with 1,000 mounts free). Send for list, which includes: 20 British Colonials, 2 Liberia Triangles, 23 Czecho-Slovakia, 25 North America, 4 Ingermannland, 10 Venezuela, 40 Germany (all Mint), 50 Bavaria.

Any one of the above **free** if you enclose postage and ask to see Approval Sheets.

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Containing 1,000 different Stamps, includes 125 French Colonials 50 mint, 125 French Colonials 50 Mint. British Colonials. Pictorials. Airpost, etc. Marvellous value.

Price **10/6** post free.

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100 Austria	... 1/-	**40** Argentine	... 1/-
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100 U.S. ...	... 1/-	**500** Revenue	... 5/-
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Fine selection of Postage or Revenue ready.

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Stamp Gift, cat. 2/6 (1½d.). 3 Complete Sheets (cat. 24/-) 3/-. Collection 240 var. (cat. £5) 10/6. Set Nicaragua 1869 (cat. 5/9) 9d. Rare stamps one-third cat.

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The "Bazaar" says: "An opportunity not to be missed."

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Or any one of the following Gifts if you prefer it:
15 Pictorial Oedenburg. Surprise Pkt. of 100 Diff.
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Xmas Pkts., 1,000 Different (Cat. over £5), 7/- each.

Become a Multi-Millionaire to-day and write to

ALBAN SIMMONS, HILLSIDE, NEW BARNET

100 All Different Stamps Free

Many unused. Send postcard only.

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6 German Air Post, 1-25 m.	4d.
8 German 100–800,000 m.	9d.
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5 Venezuela, 1904, 5c.–3b.	4½d.
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All Unused.	
50 All Different (Used and Unused)	6d.

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Fits into vest pocket. Contains sets from Canada, Japan, etc. Given free to applicants sending postcard or approval sheets.

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(Member J.P.S., etc., etc.)

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Stamp Collecting and Dealing is a Fascinating Hobby—it is also a very Paying Profession. For full particulars of the easiest, quickest and cheapest means of becoming an Expert, apply Dept. MEC.

ATKINSON & CO.,

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Let the Child make his own Printing Blocks, and print coloured pictures of his own design, with the "Endsleigh" Outfit, 3/11. (Post Free 4/3).

Harris & Sons, 70, George Street, Plymouth.

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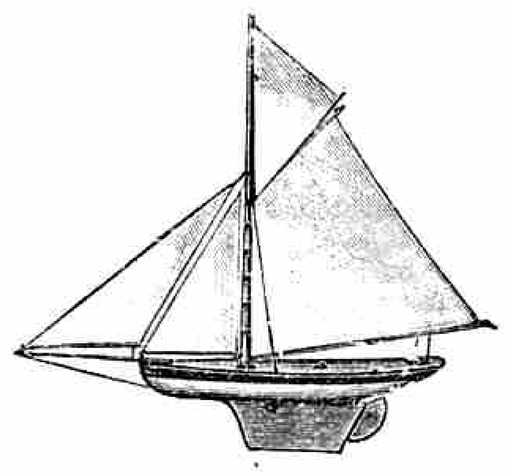
Bumble Crystal Receiving Sets, guaranteed for 30 miles, **7/-** each. Not a toy, but a complete set.
Complete set of finished parts, **6/-.**
Variometers with knob, **4/6.**
Contact Studs, ¼"×¼", per doz., **6**d.
Filament Resistances with knob and engraved dial, **2/10.**
List of accessories, ½d. stamp.

The H.S. Radio Co., 36, Willes Road, Leamington.

Kensington Model Dockyard



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Price List "M" Post Free 3d.

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From 40 ft.

Dramas, Cowboys, Comedies—Lists Free

Nature, Travel and Sports Films, Round-the-World Series and the Latest Topicals, etc.

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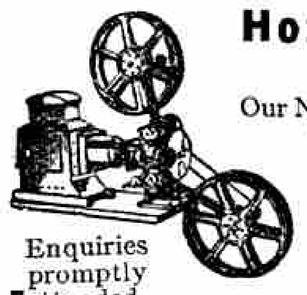


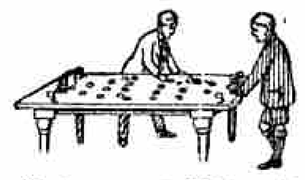
Enquiries promptly attended to.

Home Cinematographs and Films

Our New Season's Illustrated Catalogue of Toy and Professional Machines, from **8/6**, and Accessories, now ready. Films, all lengths and subjects, for sale or exchange.

FORD'S (Dept. M.), 13, Red Lion Square, London W.C.1.
Entrance Dane Street.

FOUNTAIN PENS, extra quality, complete with filler and box. Our price 5/6 post free. A useful present. Box No. 21, c/o "*Meccano Magazine*," Liverpool.



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JUST LIKE THE REAL THING. A Chum and a Table are all you require.

Order your Team to-day and start a League among your Chums. *Team Set* (11 *a side*) 2/6, *League Set* (11 *a side*) 10/6. Also **SKIDS CRICKET** (11 a side) 3/6. Post Paid. Postage abroad 1/- extra.

Ask your Dealer for them, or write direct to

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MAKE YOUR OWN ELECTRIC LIGHT

5/- Every "Meccano" reader who is interested in Electricity or who one day wants to be an Electrical Engineer should get one of these wonderful Dynamos and learn how Electricity is made. They are easy to work. Will

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5/-

CUT THIS OUT.

"Meccano" Pen Coupon. Value 3d.

Send 5 of these coupons with only 2/9 direct to the **Fleet Pen Co., 119, Fleet Street, E.C. 4.**

You will receive by return a splendid British 14-ct. Gold Nibbed Fleet Fountain Pen value 10/6 (Fine, Medium, or Broad Nib). If only 1 coupon is sent, the price is 3/9. 3d. less for each extra coupon up to 4 (Pocket Clip 4d.). Satisfaction guaranteed. Your own name gilt letters, either pen 1/- extra.

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2/6 Weekly

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The Worlds Best Toys.

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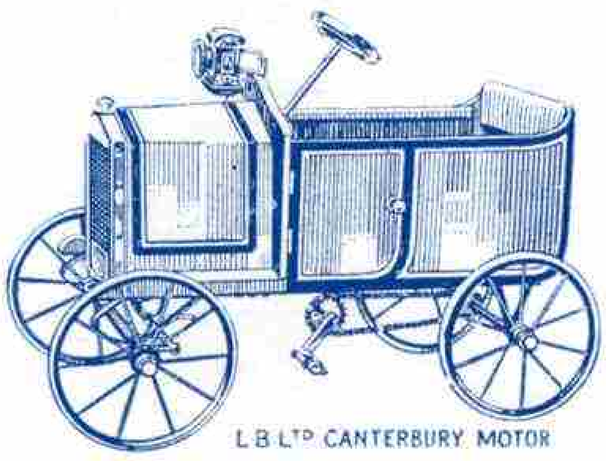
ASK FOR THEM AT YOUR TOYSHOP



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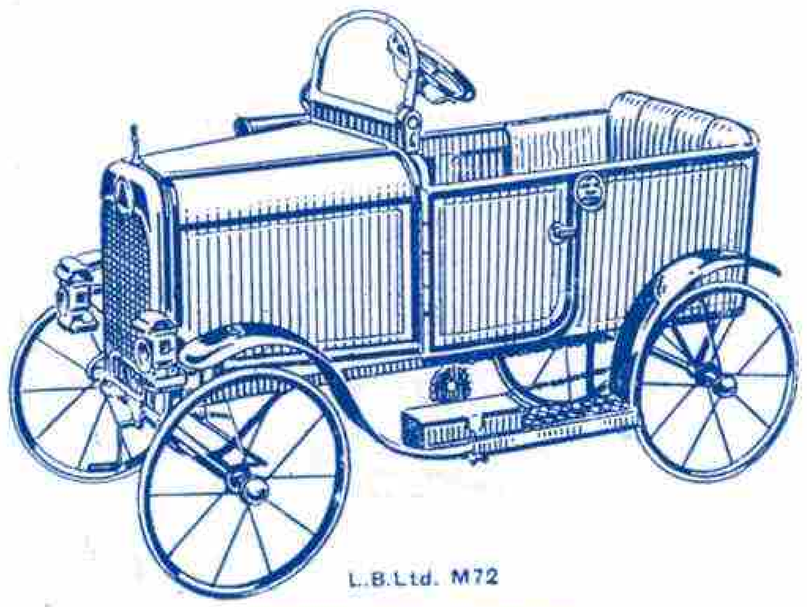
For children 3-8 years, with pedalling gear, upholstered seat, side door to open, Rolls Royce pattern radiator and lamp **65/3**



HUSTLER MOTOR
For children 3–9 years, complete with pedalling gear, lamps, mascot, tool box, licence card carrier, horn, windscreen and opening door **115/6**

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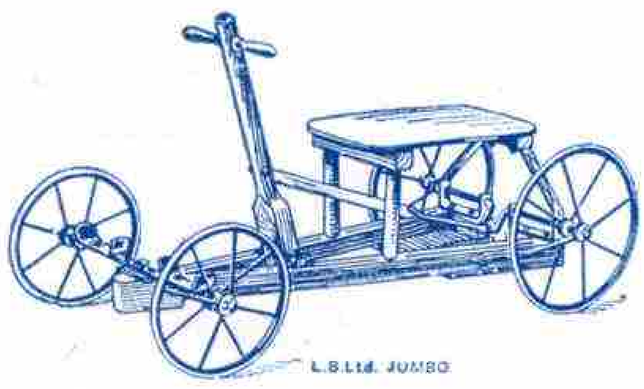
For boys and girls. Strongly made on cycle principles of solid drawn steel tubing. Aluminium footboard, 12 in. wheels with ½ in. wired-on tyres. Plated handlebar. Outlasts several ordinary scooters ... **27/-**



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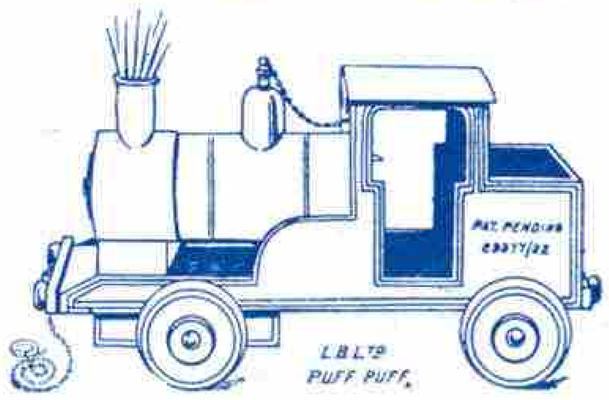
Comfortable, safe and strongly made. Handle-propelled. 35 in. long. For boys and girls **23/3**



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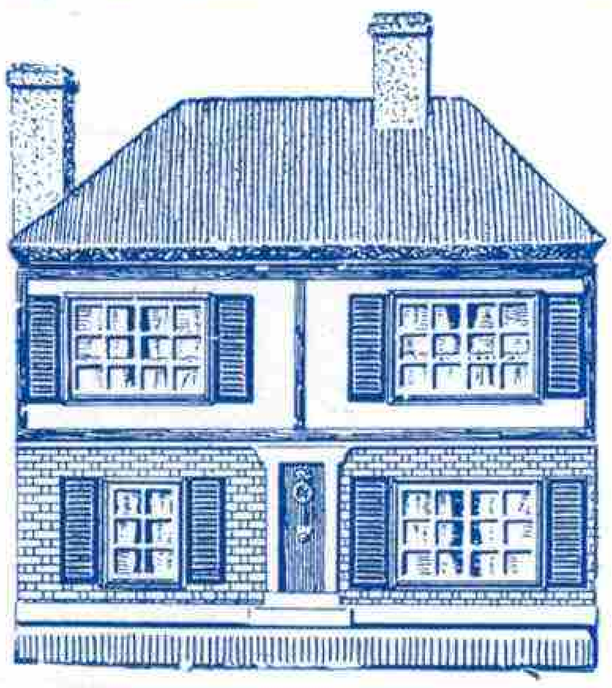
Puffs like a real engine when drawn along. Fitted with a whistle. Splendidly painted, lined and varnished. 21½ in. long **15/-**



No. 9 PERIOD DOLL'S HOUSE
Four rooms, hall, staircase, fireplaces, rough cast half timbered and red brick exterior, curtains, sun shutters, brass knocker and letter plate. 27 in. wide, 31 in. high, 16½ in. deep. **60/-**

THE FAIRYCYCLE
(Regd. Trade Mark).
Built like a bike—but safer. Adjustable saddle and bars, mudguards, free wheel, brake, ball bearing rubber pedals, 12 in. wheels with ⅝ in. wired-on tyres. Look for the triangle trade mark on the frame. **59/6**. Or with Pneumatic Tyres and Ball-Bearing Tangent Spoke Wheels, **89/6**. None genuine without the Fairycycle Trade Mark.

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On strap-hung outside C springs. 12 in. wheels with rubber tyres. 24 in. by 13 in. body. Beautifully panelled and painted. Apron included. Reversible Hood. Nickel-plated *Tubular* Handle Rods and Fittings **59/3**

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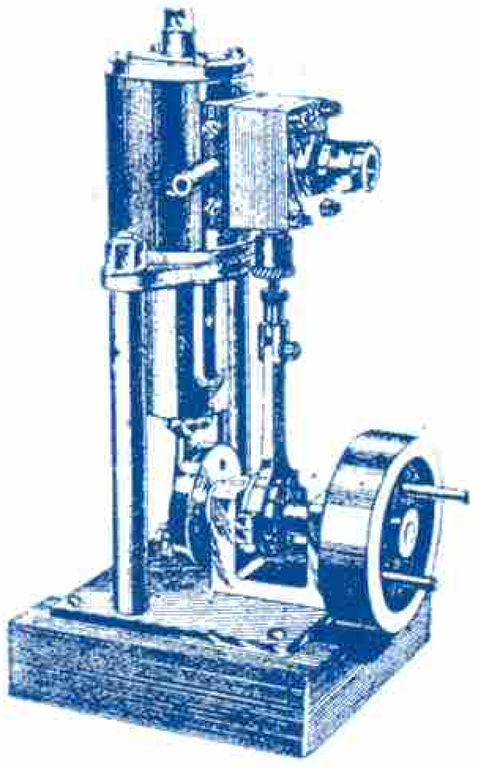
A Wonderful Enchanted Castle filled with Hundreds of Toys, Games, Models, Bicycles, Pets, Cinematographs, and Special Surprises and Mysteries, and Assistants who thoroughly understand the needs of the Modern Boy—Truly a Wonder-Store for Boys.



V 630.

SPECIAL VALUE LAUNCH ENGINE

With double action slide valve cylinder, ½ in. bore, ¾ in. stroke, trunk guide, steel connecting rod and crank shaft, disc crank, heavy flywheel with coupling. All working parts arranged for lubrication. Mounted on brass foundation plate, with stern tube and stuffing box, 3 blade propeller and shaft, with coupling complete.

Ty. 1. ½ in. bore, ¾ in. stroke, for 3 ft. boat ... 24/-
Ty. 2. ⅝ in. bore, ⅞ in. stroke, for 3 ft. 6in. boat, 28/6
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Ty. 4. 1 in. bore, 1 in. stroke. Suitable for 4 ft. to 5 ft. boat 36/-

Above finished Nickel-plated, 7/6 extra.

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COLLECTION of MATCH BOX JOKES

One won't light; another falls to pieces; a third won't move; snake jumps out of the fourth. Excellent value. Post 3d. ... Price **1/6**

CONJURING CABINETS

A wonderful assortment of startling tricks, complete with full instructions. Price **7/9**

Larger Sizes:—
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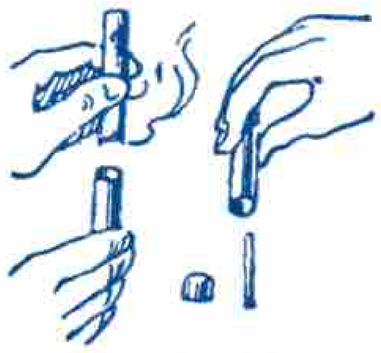
Small Boys' Cabinets...2/9 and 4/6
Post 3d.

Write for a copy of the beautifully illustrated Conjuring Catalogue. The most complete guide in the world. Sent post free upon application.



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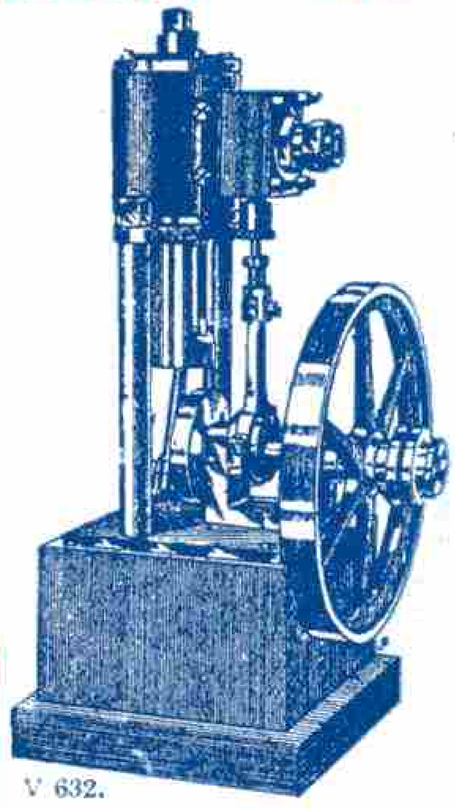
A cigarette is dropped in metal case and lid placed on it; it is then given to a spectator to hold; the cigarette is now discovered elsewhere; upon the case being opened and examined by audience cigarette is found to have disappeared, and there is a match in its place. Beautifully made. Post 2d. ... Price **2/6**



V 632.

VERTICAL HIGH-SPEED ENGINE

As illustration. Fitted with double-action slide valve cylinder, trunk guide, steel connecting rod and crank shaft, disc crank and very massive flywheel, 3-speed pulley for round belt. All parts arranged for lubrication. The bed-plate is of solid brass and extra heavy, and is mounted on a stout wooden block.

No. 1. ½ in. bore, ¾ in. stroke 22/6
No. 2. ⅝ in. bore, ⅞ in. stroke 27/-
No. 3. ⅞ in. bore, 1⅛ in. stroke 31/6
No. 4. 1 in. bore, 1 in. stroke 36/-
Post Free.

Above finished Nickel-plated, 7/6 extra.

ALL THESE SPLENDID THINGS & 1,001 OTHERS IN THE GORGEOUS CHRISTMAS CATALOGUE!

(A COPY OF WHICH WILL BE SENT FREE ON REQUEST)

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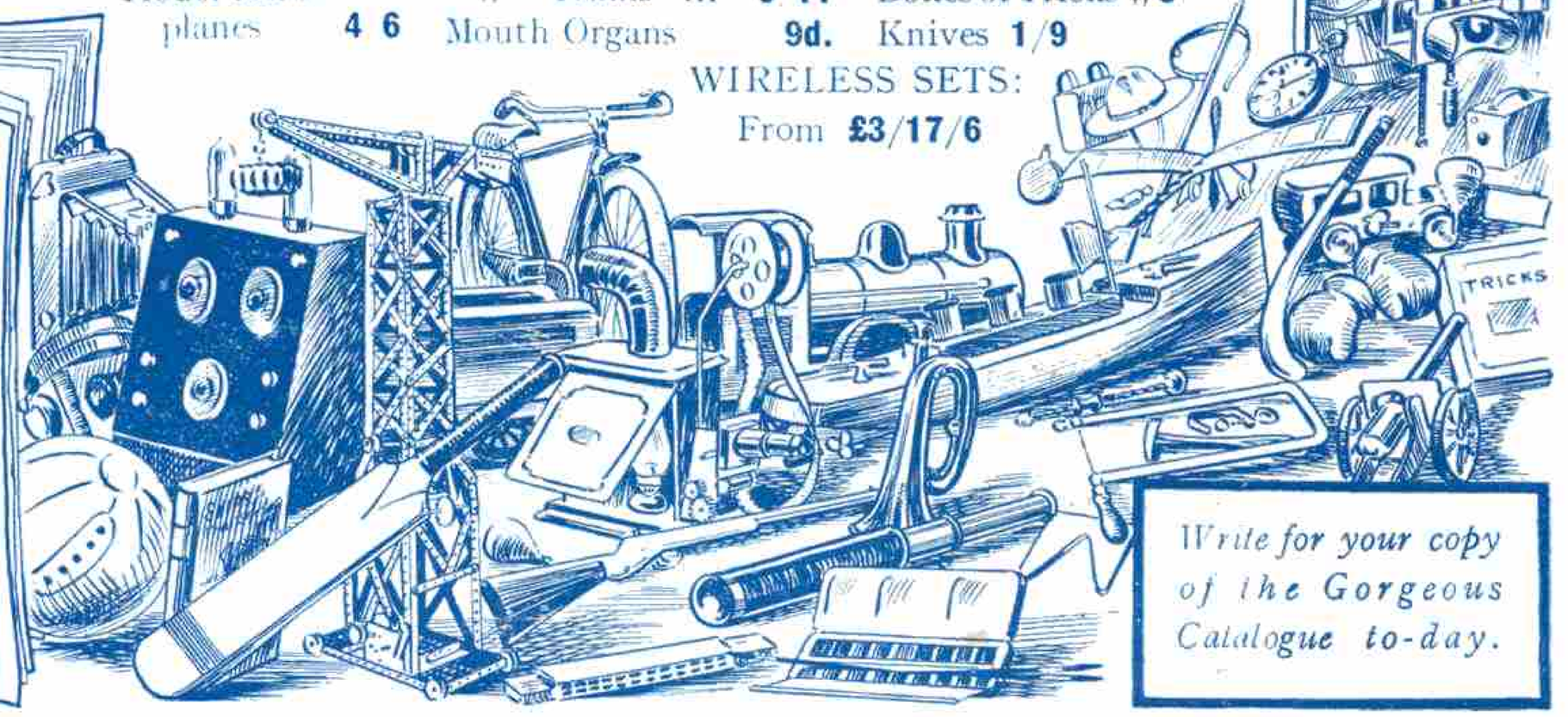

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